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CHEMICAL WARFARE REVIEW COMMISSION

HEARING

BEFORE THE

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UNITED STATES SENATE

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CHEMICAL WARFARE REVIEW COMMISSION

WEDNESDAY, MAY 1, 1985

U.S. SENATE,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

The committee met in open session, pursuant to notice, at 10:07 a.m., in room SR-222, Russell Senate Office Building, Senator Barry Goldwater (chairman) presiding.

Present: Senators Goldwater, Thurmond, Warner, Humphrey, Quayle, Wilson, Denton, Nunn, Hart, Exon, Levin, Kennedy, Dixon, and Glenn.

Staff present: James F. McGovern, staff director and chief counsel, and Arnold L. Punaro, staff director for the minority; Robert G. Beli, Robert F. Bott, Douglas R. Graham, and George K. Johnson, Jr., professional staff members; and Karen A. Love, staff assistant.

Also present: Gerald J. Smith, assistant to Senator Goldwater; Romie L. Brownlee, assistant to Senator Warner; Robert P. Savitt, assistant to Senator Cohen; James M. Bodner, assistant to Senator Cohen; Henry D. Sokolski, assistant to Senator Quayle; Mark J. Albrecht, assistant to Senator Wilson; Alan W. Cameron, assistant to Senator Denton; Deforest Hamilton, assistant to Senator Denton; Mary A. Shields, assistant to Senator Stennis; Janne E. Nolan, assistant to Senator Hart; Jeffrey B. Subko, assistant to Senator Exon; James B. Steinberg, assistant to Senator Kennedy; Edward McGaffigan, Jr., assistant to Senator Bingaman; Charles C. Smith, assistant to Senator Dixon; and Phillip P. Upschulte, assistant to Senator Glenn.

OPENING STATEMENT BY SENATOR BARRY GOLDWATER, CHAIRMAN

Chairman GOLDWATER. The meeting will come to order.

In the interest of time the opening statement by Senator Thurmond, who was going to chair this hearing but can't be here, will be inserted in the record.

[The prepared statement of Senator Thurmond follows:]

PREPARED STATEMENT OF SENATOR STROM THURMOND

The committee convenes in open session this morning to receive testimony from the Chemical Warfare Review Commission. In view of the importance that the committee attachés to the modernization of the U.S. chemical deterrent, I believe that it is important that we have the opportunity to receive the Commission's findings and recommendations before the fiscal year 1986 defense authorization bill goes to the floor of the Senate.

The conference report on the fiscal year 1985 defense authorization bill directed that the President establish an independent bipartisan Chemical Warfare Review Commission. This Commission was to study the broad range of military and foreign policy issues surrounding the U.S. chemical deterrent posture, and report its findings and recommendations to the Congress this spring. I understand that a summary of the Commission's findings and conclusions, as well as an endorsement of them by the President, will be forwarded to the Congress in the next several days.

I am pleased to welcome our witness this morning, Ambassador Walter J. Stoessel, Jr., who served as the chairman of the Chemical Warfare Review Commission. Ambassador Stoessel has served his country with distinction in a number of capacities over the years. He was the U.S. Ambassador to the Soviet Union from 1974-1976, after which he became our Ambassador to West Germany. Ambassador Stoessel left that post in 1981, and returned to the United States to serve as the Deputy Secretary of State.

Ambassador Stoessel, on behalf of the committee, I would like to welcome you this morning. I would like to take this opportunity to commend you for your leadership on the Commission, and the timely manner in which you completed your work. I was very pleased that the administration was able to attract such a distinguished group to serve on this important Commission. Your findings and recommendations will be a major factor in securing congressional approval for the Binary Chemical Modernization Program this year.

In my judgement, and I believe this view is shared by a number of my colleagues on this committee, the modernization of the U.S. chemical deterrent is one of our highest national security priorities. Ambassador Stoessel, I look forward to your testimony.

Chairman GOLDWATER. I wanted Senator Warner to chair this hearing because what we are talking about comes under his jurisdiction. You may start and when Senator Warner gets here I will just move over.

I will ask Senator Nunn if he has any statement?

Senator NUNN. I will put mine in the record. This is a very important subject and the Ambassador and his group have done a good job. It is a tough question for everyone who has to vote on it.

I am one of those who strongly believes we need to modernize our chemical capabilities, primarily for safety purposes, for deterrent purposes and I think most of all for arms control purposes in the long run.

I welcome the Ambassador here this morning.

I will put the rest of my statement in the record.

[The prepared statement of Senator Nunn follows:]

PREPARED STATEMENT OF SENATOR SAM NUNN

Mr. Chairman, when the Senate takes up the fiscal year 1986 DOD authorization, it will resume what has been an extremely controversial debate over whether this country should end its self-imposed, 16-year old unilateral moratorium on the production of new chemical weapons.

In 1983, debate in the Senate on the administration's binary weapons production request twice resulted in tie votes, both of which were broken when the Vice President voted in favor of going forward with this program. Although binary production was approved in the fiscal year 1984 Authorization Act, funds were deleted from the Appropriation Act at the insistence of the House. In 1984, the administration decided not to press this proposal in an election year.

In the year and a half since the Senate last voted to approve this proposal, the arguments for going forward with new production have gotten stronger. The clear Soviet superiority in deployed chemical warfare capabilities has widened. The aging U.S. stockpile has grown smaller as obsolete systems are demilitarized, and concerns about the deterioration of chemical agents in their devices have become more pronounced. The types of agents available to U.S. field commanders reman ill-suited to current operational doctrine.

Last, but certainly not least, the Soviets have remained virtually intransigent in the unsponsored negotiations on a total, world-wide chemical weapons ban. This despite the introduction last April by Vice President Bush of a extraordinary far-

reachng U.S. draft treaty that included a proposal for "open invitation" onsite inspection "anywhere, anytime".

Mr. Chairman, I expect that the debate on this issue in the weeks ahead will again be very heated. But in that debate, I would urge all my colleagues to remember that we all seek the same goals. In the long term, we seek a mutual and verifiable treaty that would banish these weapons from the face of the Earth. Until and unless that goal can be realized, though, we must rely upon the maintenance of a credible U.S. deterrent that will ensure that these horrible devices will never be used against our citizens, our troops, or our allies.

Mr. Chairman, I look forward to hearing the testimony this morning of our expert witness. Ambassador Stoessel has every distinguished record of public service to his country and has performed admirable in leading this Commission.

Chairman GOLDWATER. Senator Dixon, I believe you wish to make a statement.

Senator DIXON. Thank you, Mr. Chairman.

[The prepared statement of Senator Alan J. Dixon follows:]

PREPARED STATEMENT OF SENATOR ALAN DIXON

Mr. Chairman, I am sure all of us would welcome the complete elimination of chemical weapons through a treaty with the Soviet Union. The question we are faced with, however, is whether we will replace our outdated stockpile of unsafe unitary weapons with safer binary weapons.

I look forward today to hearing Ambassador Stoessel's testimony and hopefully learning how close we are to meeting with the Soviet Union.

I believe that as long as the Soviet Union continues its chemical weapons program, we must maintain a credible deterrent to insure that the Soviet's weapons are never used against us or our allies. As long as there is a lack of a mutual ban on all chemical weapons, we must maintain a minimal, but safe, deterrent.

Chairman GOLDWATER. Ambassador Stoessel, you may proceed.

STATEMENT OF AMBASSADOR WALTER J. STOESSEL, CHAIRMAN, PRESIDENT'S CHEMICAL WARFARE REVIEW COMMISSION

Ambassador STOESSEL. Thank you very much, Mr. Chairman, it is an honor and privilege to appear before the committee this morning.

I have submitted the text of my testimony. I would like to summarize the findings of the Chemical Warfare Review Commission which was established by the President in accordance with the provisions of section 1511 of the Department of Defense Authorization Act of 1985.

The members of the Commission in addition to myself I have listed in the testimony.

The Congress directed the commission to "review the overall adequacy of the chemical warfare posture of the United States with particular emphasis on the question of whether the United States should produce binary chemical munitions."

The Congress posed four specific questions which I will refer to in subsequent remarks.

We began our work by considering established U.S. policy with regard to chemical weapons. This policy has three elements.

The first is that the United States should actively pursue a multilateral, verifiable ban on the development, production and stockpiling of chemical weapons.

Second, until such a ban is achieved, the United States will retain a capability to deter chemical attack by other powers.

Last, there will be no first use, that is, the United States will never use chemical weapons except in retaliation for use against the United States or its allies.

The Commission found that this policy continues to be appropriate and we stress the priority which we attach to achieving a multilateral, verifiable ban.

I would like now to address the specific questions posed by the Congress and to convey the findings of the Commission to date. They will appear in the final report of the Commission which is now in preparation.

I would like to note that we met with President Reagan on April 26, last Friday, and we reported our findings to him. He received them favorably and expressed his strong support for our conclusions.

The first request of Congress was to evaluate the effect of modernization on achieving a chemical warfare ban. We found that modernization would increase the chances of achieving such a ban. We noted that in the 16 years since the United States established unilaterally a policy of renouncing the production of chemical munitions, there has been no progress made with the Soviets toward achieving such a ban.

On the contrary, the Soviets have continued a very intensive program of production, research, and development in the chemical warfare field.

Second, the Congress asked our views as the adequacy of the existing stockpiles to deter. We found that the stockpile is old; the munitions and agents in the stockpile are 20 to 40 years old. It is deteriorating. The bulk of the stockpile is militarily useless. A small fraction of the stockpile does have deterrent value. All of the munitions and agent in the stockpile are hazardous to handle.

The Soviet capability is sizable and increasing and to prevent quick defeat or early nuclear escalation, we found that a more credible capability is needed. If we do not achieve such a capability, this could leave the United States with only nuclear retaliation as a response.

We also concluded that the current stockpile should be destroyed at an accelerated rate.

The third request by Congress related to binary weapons and whether the proposed program by the Department of Defense for production of binary weapons would be adequate to deter. We found in the affirmative in answer to this question; that is, the proposed binary program would provide an adequate deterrent to meet our present needs and that it is necessary because of the deteriorating condition of our stockpile.

Binaries have a great advantage in safety. They provide a safer, separate packaging of nonlethal chemical elements. They are easier to handle, to transport, and they avoid potential environmental hazards.

The fourth and last question related to defensive measures. Would defensive measures alone be adequate to meet the Soviet threat? Here we found that we cannot depend on protection alone to offset Soviet advantages from use of chemical munitions.

Defensive equipment imposes severe handicaps on personnel. With no retaliatory capability, an overwhelming advantage for the attacker with chemical weapons is perceived.

Those are our conclusions with regard to the questions asked by Congress. We arrived at several additional conclusions.

One is that deployment of binary weapons in foreign countries in peacetime is not essential because of the safety and the speed of transport of the binary munitions.

Second, we feel that research and development for defense and detection and also on retaliatory chemical agents and munitions should be accelerated to deter the adversary and to develop countermeasures.

We also felt that our intelligence effort with regard to chemical warfare activities in the Soviet Union and other countries should be improved.

So, Mr. Chairman, these are our basic findings. Our full report is now being prepared and it will be ready for delivery to the President and transmission to the Congress within a few weeks.

I thank you for your attention. I will be pleased to respond to your questions.

[The prepared statement of Ambassador Stoessel follows:]

PREPARED STATEMENT OF AMBASSADOR WALTER J. STOESSEL, JR., CHAIRMAN, CHEMICAL WARFARE REVIEW COMMISSION

Mr. Chairman, it is my privilege to present to the Committee the preliminary findings of the bipartisan Chemical Warfare Review Commission, established by the President in Executive Order 12502 of January 28, 1985, in accordance with the provisions of Section 1511 of the Department of Defense Authorization Act of 1985.

Those appointed to serve on this commission were, in addition to myself, Mr. Phillip John Bakes, President of Continental Airlines; Dr. Zbigniew Brzezinski, former Assistant to the President for National Security Affairs; General Richard E. Cavazos, whose last active-duty position was Commander, U.S. Army Forces Command; the Honorable Barber B. Conable, Jr., formerly a member of the House of Representatives from New York; the Honorable John N. Erlenborn, formerly a member of the House of Representatives from Illinois; General Alexander M. Haig, Jr., former U.S. Secretary of State and also former Supreme Allied Commander, Europe; and Mr. John G. Kester, a partner in the Washington law firm of Williams and Connolly and former Special Assistant to the Secretary of Defense.

The Congress directed this Commission to "review the overall adequacy of the chemical warfare posture of the United States with particular emphasis on the question of whether the United States should produce binary chemical munitions."

The Commission was further directed to consider the relationship of this matter to United States efforts for a multilateral, verifiable ban on chemical weapons; the adequacy of the current United States stockpile of chemical weapons in providing a credible deterrent to Soviet use of chemical weapons against United States and allied forces; whether the proposed binary program will provide a credible deterrent to chemical warfare; and, finally, whether defensive measures alone are adequate to meet the Soviet chemical warfare threat and whether current and projected funding of defensive measure programs is adequate.

The Commission has been meeting for two months, and has carefully studied all these matters. It began by considering United States policy with respect to chemical weapons. That policy has three elements:

Arms control. The United States will actively pursue the achievement of a multilateral, verifiable ban on the development, production, and stockpiling of chemical weapons.

Deterrence. Until such a ban is achieved and in effect, the United States will retain the capability to deter chemical attack by other powers.

No first use. The United States will never use chemical weapons except in retaliation for the use of chemical weapons against the United States or its allies.

The Commission has concluded that the policy as stated continues to be appropriate. The members of the Commission wish to stress their conviction that achieving a multilateral, verifiable ban on chemical weapons should remain a priority aim of the United States.

In carrying out its work, the Commission reviewed the history of chemical weapons use, the scientific characteristics of modern chemical warfare agents, the technology of chemical defenses and chemical munitions, and the technology for demilitarizing obsolete and deteriorating munitions. The Commission has heard briefings

by intelligence specialists on the Soviet Union's capability in both offensive weaponry and defense, and also on the spread of chemical weapons possession and the authenticated use of these weapons in warfare in recent years.

Members of the Commission traveled to Europe, where we spoke with U.S. commanders and service men and women, and representatives of our NATO allies. We also viewed a portion of the current stockpile at several locations in the United States.

The Commission has reached a general consensus on the matters we were asked to consider, and I should now like to convey to you our findings to date, which I expect will appear in substantially this form in the final report.

On the matter of the relationship of stockpile modernization to the U.S. goal of achieving a multilateral, verifiable ban on the development, production, and stockpiling of chemical weapons, the Commission believes that modernization would be likely to increase the chances of achieving such a ban. The Commission has noted that in the 16 years since the unilateral renunciation by the U.S. of production of chemical munitions the Soviet Union has not progressed substantially toward acceptance of such a ban; on the contrary, it has continued its intensive program of production and research and development for chemical munitions.

On the matter of the adequacy of the existing stockpile to deter, this is what the Commission found:

The existing U.S. store of chemical weapons dates from the 1940's through 1960's and is in deteriorating condition. The bulk of it is militarily useless; a small fraction of the stockpile has deterrent value. All of it is potentially hazardous to handle.

Soviet chemical warfare capability is sizable and is increasing.

A more credible U.S. chemical retaliatory capability is needed in order to prevent either quick defeat or early escalation to a nuclear exchange in the event chemical weapons are used by the adversary.

Failure to acquire an effective chemical retaliatory capability could leave the United States with only nuclear retaliation to deter chemical attack.

The current stockpile should be destroyed at an accelerated rate.

The Commission carefully considered the proposed binary program, and came to the following conclusions:

The binary program will provide an adequate deterrent capability to meet our present needs and is necessary because of the deteriorating condition of the current stockpile.

The great advantage of the proposed binary munitions is safety.

The projected binary munitions program will not produce a more lethal generation of weapons. It provides, rather, a safer, separate packaging of nonlethal chemicals that combine to form lethal agents only when launched. The agents which would be formed after launching are identical to the lethal agents already produced and stored in the U.S. stockpile.

Substitution of these safer binary weapons to replace existing U.S. munitions filled with lethal nerve agent will provide much greater safety for U.S. personnel, and will simplify transport and handling. In addition, effective elimination of potential environmental hazards will be far easier and less expensive.

On the question of whether defensive measures alone are adequate to meet the Soviet threat, the Commission found:

The expectation that protective measures alone can offset the advantages to the Soviets from a chemical attack is not realistic.

Even if the defensive equipment works, it severely handicaps personnel who must wear it. Without a retaliatory capability, this leads to an overwhelming military advantage for the attacker armed with chemical weapons.

In addition to its conclusions on the four matters it was specifically asked to address, the Commission reached several additional conclusions on the basis of its extensive review of this country's chemical warfare posture. Here are those additional conclusions:

On the matter of deployment of binary munitions, the Commission concluded that peacetime deployment of binary munitions in foreign countries is not essential, because of the safety and spped with which these munitions can be transported.

The Commission concluded that research and development efforts on both defensive items and detection equipment, as well as on retaliatory chemical agents and munitions, should be accelerated, both in order to deter the Soviet Union from using new agents and in order to develop countermeasures.

Finally, the Commission concluded that U.S. intelligence gathering and analysis regarding chemical warfare activities of the Soviet Union and other countries should be greatly improved.

A full report on the Commission's review of U.S. chemical warfare posture, which will amplify our views and may contain additional conclusions and recommendations, is now being prepared and will be ready for delivery to the President for transmission to Congress within a few weeks.

If, in the meantime, members of this committee have questions about the thinking or data that underlie the conclusions I have presented, I shall be happy to discuss these with you.

Summary of Findings and Conclusions

This Commission was directed by the Congress to review the overall adequacy of the chemical warfare posture of the United States. The Commission began by considering United States policy with respect to chemical weapons. That policy has three elements:

Arms control. The United States will actively pursue the achievement of a multilateral, verifiable ban on the development, production, and stockpiling of chemical weapons.

Deterrence. Until such a ban is achieved and in effect, the United States will retain the capability to deter chemical attack by other powers.

No first use. The United States will never use chemical weapons except in retaliation for the use of chemical weapons against the United States or its allies.

The Commission found that the policy as stated continues to be appropriate.

The Commission was directed by the Congress to consider four specific questions: [1]

1. The relationship of chemical stockpile modernization by the United States with the ultimate goal of the United States of achieving a multilateral, comprehensive, and verifiable ban on chemical weapons;
2. The adequacy of the existing United States stockpile of unitary chemical weapons in providing a credible deterrent to use by the Soviet Union of chemical weapons against the United States and allied forces;
3. Whether the binary chemical modernization program proposed by the Department of Defense is adequate to support United States national security policy by posing a credible deterrent to chemical warfare; and
4. The ability of defensive measures alone to meet the Soviet chemical warfare threat and the adequacy of funding for current and projected defensive measure programs.

The following are the Commission's findings on each of the four points it was directed to address:

The Effect of Modernization on Achieving a Chemical Weapons Ban

The Commission believes that modernization would likely increase the chances of achieving a multilateral, verifiable ban on chemical weapons. The Commission notes that in the 16 years since the unilateral rununciation by the U.S. of production of chemical munications, the Soviet Union has not progressed toward acceptance of such a ban; on the contrary, it has continued its intensive program of production and research and development for chemical munitions.

Adequacy of the Existing Stockpile to Deter

The Commission has found that:

The existing U.S. store of chemical weapons dates from the 1940's through 1960's and is in deteriorating condition. The bulk of it is militarily useless; a small fraction of the stockpile has deterrent value. All of it is potentially hazardous to handle.

Soviet chemical warfare capability is sizeable and increasing.

A more credible U.S. chemical retaliatory capability is needed in order to prevent either quick defeat or early escalation to a nuclear exchange in the event chemical weapons are used by the adversary.

Failure to acquire an effective chemical retaliatory capability could leave the United States with only nuclear retaliation to deter chemical attack.

The current stockpile should be destroyed at an accelerated rate.

The Binary Chemical Program

The Commission has found that:

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[1] These four questions were incorporated into the three tasks of Executive Order 12502, dated January 28, 1985.

The proposed binary program will provide an adequate deterrent capability to meet our present needs and is necessary because of the deteriorating condition of the current stockpile.

The great advantage of the proposed binary munitions is safety.

The projected binary munitions program will not produce a more lethal generation of weapons. It provides, rather, a safer, separate packaging of nonlethal chemicals that combine to form lethal agents only when launched. The agents which would be formed after launching are identical to the lethal agents already produced and stored in the U.S. stockpile.

Substitution of these safer binary weapons for existing U.S. munitions filled with lethal nerve agent will provide much greater safety for U.S. personnel and will simplify transport and handling. In addition, effective elimination of potential environmental hazards will be far easier and less expensive.

DEFENSIVE MEASURES

The Commission has found that:

The expectation that protective measures alone can offset the advantages to the Soviets from a chemical attack is not realistic.

Even if defensive equipment works, it severely handicaps personnel who must wear it. Without a retaliatory capability, this leads to an overwhelming military advantage for the attacker armed with chemical weapons.

ADDITIONAL CONCLUSIONS

The Commission in the course of its deliberations has also arrived at these additional conclusions:

Deployment.—The Commission does not consider peacetime deployment of binary munitions in foreign countries to be essential, because of the safety and speed with which these munitions can be transported.

Research and Development.—The Commission believes that research and development efforts on both defensive items and detection equipment, as well as on retaliatory chemical agents and munitions, should be accelerated, both in order to deter the Soviet Union from using new agents and in order to develop countermeasures.

Intelligence.—The Commission believes that U.S. intelligence gathering and analysis regarding chemical warfare activities of the Soviet Union and other countries should be greatly improved.

Chairman GOLDWATER. Thank you, Mr. Ambassador.

Senator Nunn.

Senator NUNN. Thank you, Mr. Chairman.

Mr. Ambassador, we appreciate your service to this country in many capacities. I think this is one of your most important contributions. We are grateful to you and the members of the Commission for addressing this very difficult and controversial subject.

I have two or three questions.

One, you say the current stockpile should be destroyed at an accelerated rate, if I understood you.

Is that based on the assumption we are going to produce binaries or is that independent of whether we do or do not produce binaries?

Ambassador STOESSEL. As I said, the condition of the stockpile is not good and a very small percentage of the current stockpile is serviceable. I feel that there should be production of binaries combined with destruction of the stockpile.

If there is no production of binaries, I would not wish to proceed to destroy the serviceable portion of the stockpile.

Senator NUNN. What portion is that, or is that classified?

Ambassador STOESSEL. The proportion of serviceable munitions which meets military requirements is approximately 3 percent of the total.

Senator NUNN. You say 97 percent of our stockpile is not militarily useful?

Ambassador STOESSEL. A portion, about 25 percent, is serviceable and could be used.

Senator NUNN. Meaning 75 percent is not serviceable?

Ambassador STOESSEL. That is right. The 25 percent I mentioned is composed of munitions which do not adequately meet military requirements in terms of range, agent mix, and so on. So, it could be used, but it would not meet the requirements.

Senator NUNN. In other words, that 25 percent might serve as a deterrent, but would not be very effective if required to be used; is that correct?

Ambassador STOESSEL. That is correct.

Chairman GOLDWATER. How many days would this supply a war in Europe?

Ambassador STOESSEL. Mr. Chairman, I think that is a classified question. We will be glad to provide that answer to you directly.

Senator NUNN. To pin this down further, 75 percent is not serviceable and, therefore, not militarily useful. Twenty-five percent is serviceable and has some deterrence.

How much of the 25 percent is militarily effective or how much is 100 percent militarily effective?

Ambassador STOESSEL. As I said, the 3 percent is what is really effective and what really would be usable. The 25 percent, as you have indicated, could be seen as a part of a deterrence, but is not what is required in the circumstances.

Senator NUNN. Would it be fair to say then that 75 percent of our present stockpile ought to be destroyed whether or not we produced new replacements?

Ambassador STOESSEL. Yes, I would say so. Sixty-one percent of the stockpile is in bulk, bulk agent. We have no filling equipment to put that into munitions. Moreover, we have no munitions to put the agent into if we had the filling equipment. That is 61 percent. Eleven percent is obsolete, deteriorating, dangerous, leaking. Those should certainly be destroyed.

The 25 percent is very marginal and I would think that probably should be destroyed as well.

Senator NUNN. Do your findings contradict what has been planned by the Department of Defense or do they largely confirm that the majority of the 75 percent might well be disposed of?

Is that what the Pentagon previously had or are your findings different?

Ambassador STOESSEL. I think generally it is in accordance with the findings of the Department of Defense. Our view is that the program for destruction should be accelerated.

Senator NUNN. What was that program? Let us say of the 75 percent of our present stockpile that you think ought to be destroyed, what was the timetable for that destruction and what are you proposing for that timetable now?

Ambassador STOESSEL. The overall timetable, as I understand it, goes to 1994.

Senator NUNN. That is the present timeframe?

Ambassador STOESSEL. I am sorry, that is 1999. We would propose a reduction of that to 1994.

Senator NUNN. Instead of destroying 75 percent of our existing stockpile in the next 14 years, you are saying it ought to be done in the next 10 years?

Ambassador STOESSEL. That is correct.

Senator NUNN. Is that as soon as it is practicable in terms of physically doing it? Is that timeframe you propose based on the physical capability of an orderly destruction program?

Ambassador STOESSEL. Yes, it is. The actual destruction process which we have gone into in some detail is a very complicated one and requires special incinerators and equipment and more incinerators are needed to accomplish this destruction program.

Now, it is my understanding that the overall destruction program though 1999 would be in conjunction with the production of binaries. So, the aim would be to destroy all of the existing stocks, not just the 75 percent which you have mentioned.

Senator NUNN. Is that including the 3 percent?

Ambassador STOESSEL. Yes. That would come at the tail end of the destruction program.

Senator NUNN. You mentioned that you did not believe forward deployment, that is your Commission did not believe forward deployment was necessary during peacetime because we did have the ability I suppose to fly in those chemicals in any kind of confrontation or likely war scenario.

Is that a correct interpretation?

Ambassador STOESSEL. That is correct, yes, and also because of the safety and easy handling of the binaries it would be possible to position them on ships at sea, on aircraft carriers. They could be positioned at SAC bases. They could be flown by fighter bombers directly to the theater so that the time element would be greatly reduced.

Senator NUNN. What about the question of preparation for reception of those chemicals?

I assume binaries require different modes of handling and operation than our present chemical stockpile, whether they are forward deployed or whether they are at home.

Wouldn't production of binaries in this country require that our allies abroad take certain steps to prepare for reception of those chemical munitions in an emergency situation even if they were going to be left here at home until deployed forward?

Ambassador STOESSEL. That might well be the case. We have not gone into that. There are no specific plans of that kind in the absence of having the binaries. It would at some future time be necessary to work out plans.

Senator NUNN. Did your Commission consult with the allies about that or about their attitude in general?

Ambassador STOESSEL. We did, yes.

Senator NUNN. What did you find?

Ambassador STOESSEL. I think it is fair to say that we found there is great sensitivity about the question of chemical warfare in general and certainly about forward deployment of chemical munitions.

Our impression is that production in this country and storage in this country for use in time of need would be much more preferable from the allied standpoint than for forward positioning.

Of course, we know, for example, that the Federal Republic of Germany has recognized in its white paper of 1983 a need for NATO to possess a reprisal capability in chemical munitions.

We found that the British Government, stressing the priority attached to achieving a multilateral ban on weapons, felt that moves toward modernization by the United States could enhance the chances of achieving such a ban.

Senator NUNN. Mr. Chairman, I have some other questions, but I think I have probably used my time. I will defer for the moment.

Chairman GOLDWATER. Senator Glenn.

Senator GLENN. Thank you, Mr. Chairman.

I am sorry I had to step out and attend another hearing to introduce some people, but I am glad to be back.

Ambassador, I think you have done a great job on this.

Ambassador STOESSEL. Thank you, sir.

Senator GLENN. I couldn't agree with you more. One reason I feel so strongly about this is when I was making a Presidential effort myself here a couple years ago I don't know anything that was demagogued more than this issue. I got sick and tired of hearing this business about "I am against chemical weapons, I am against binary everything and he is for poison nerve gas," and the finger was pointed at me.

Well, I sat and took all that. I did it for one reason, because I thought it was in the best interest of my country, because I think it is a deterrent. If I didn't believe that, I would be on the other side of this argument.

I think if you go back and look at history all you have to do is look at what happened in World War I, and on down since then, and I think the record is pretty clear. When one side has chemical weapons and the other doesn't they tend to use them.

In World War I the Germans used it. We didn't have any chemical weapons. The French and British didn't either until after they were attacked by the Germans with chemicals, and they used it in a limited way. In return, it never was used again in that war.

In Word War II both sides had it; neither side used it. In Korea both sides had it; neither side used it. Went to Vietnam, limited use in Laos. The yellow rain and all that.

Then we got into Afghanistan. We find Afghans, of course, don't have any of this. The Soviets do and they are using it.

I think that record is pretty compelling, at least it is to me. It is hideous, horrible stuff. People say, do you want people writhing on the ground? I heard that over and over again, too.

War is bad, war is not very pleasant. If I had to make some guess about how the next war would start, it would not be by ICBM's coming over the pole, Star Wars, and SDI and all that sort of thing. If I had to make a guess, it would probably be that we would find a lot of nuclear weapons of suitcase size that we all know they can make now, we can make them and they can too, planted in a hundred bus stations or similar places all over this country, followed up by chemical warfare.

We would be completely incapacitated and we wouldn't have seen the first incoming ICBM.

That is a stark, horrible scenario to contemplate. That is one of the reasons we have to maintain this kind of capability for that deterrent.

Now, how do you do that? I think that is a tough one. We know that the unitary gas we developed is becoming unsafe, as you have pointed out and very properly so, and I have statistics ad nauseam on this subject that I couldn't use a few years ago.

As you also point out, much of this is still in bulk. Some of it is not. As I see it, if we have to have a deterrent, then it has to be safer for our own people. Our stockpiles are becoming unsafe for our own people. I wouldn't want a member of my family in those bunkers out there where we have had indications of possibe leakage of the ones that are not in bulk storage now.

The bulk storage, as I understand it now, even some of those containers are beginning to be suspect and we are a little nervous about it.

How do we transport this material safely? There was a big panic a year ago when a torpedo load was dumped at the intersection of Interstate 27 and 70 in the middle of Denver. If you want to get panicky, think about nerve gas, dumping their shells that are already suspect and maybe a leak drifting down across Denver someplace.

If you think you have trouble with the torpedo load that got dumped, wait until something like that happens.

The reason I support binaries is that they are absolutely safe. If you take the components and pour them out on the table, no one in this room would suffer one iota. Pour them together like they are in unitary shells right now and we have trouble. We would all be dead in a few minutes.

If we have to have a deterrent, it is safer for our own people. That is what we have to keep stressing. I don't think anything has been demogogued more than this particular issue.

The only thing I was sorry about in the summary of your report is that you did not stress more and more—I know you mentioned it—the safety of our own personnel. Transporting and handling binaries would be easier and less expensive. Some of those things you stress here I couldn't agree with you more on.

I think it is highly important we go ahead with this so that we maintain a credible deterrent, that kind of deterrent because we know what the Soviets are doing.

Mr. Chairman, I am not questioning our expert witness here, but I am stating my personal belief in this subject and backing up his testimony. I feel very strongly about that because of my personal experience with how some of this information has been mishandled in the past. I want to get on with it, because of two things.

Because it is a deterrent, a deterrent that is safest for our people. Our people. I keep saying it over and over again. Our people handling it in bunkers, handling in bulk storage, our people who have to transport it in trucks, ships, airplanes, to where it has to be used as a deterrent.

That to me is an important argument. I want safety for our people, safety for our people. That to me is what the binary weapon gives us that we don't have now and the old stockpiles are becoming more and more dangerous. I feel very strongly about it.

I couldn't agree with your conclusions more. I guess I don't have any questions.

Thank you, Mr. Chairman.

Chairman GOLDWATER. Thank you very much. I know exactly how you feel, I want to do the same thing.

Ambassador STOESSEL. I would say, Senator, many of the elements you have mentioned, particularly the history of all this, World War I, World War II, Korea, and so on, and the great emphasis on safety, all of that will be brought out more fully in our final report. We didn't have space to put it all in our findings.

Senator GLENN. If it is needed as a deterrent, let us make it safe for our people, our handling of it. The only way we can do that is by going to the binary. People don't understand that. If they did, I am sure they would support it.

Chairman GOLDWATER. Mr. Ambassador, I do want to congratulate you and your Commission for the outstanding job you have done on a very, very important subject. I thank you for myself and I thank you for the whole committee and before we get through with it, the American people will thank you.

I have a couple of questions.

What are the prospects for success of the U.S. efforts to negotiate a chemical weapons ban in Geneva if the Congress fails to approve the production of modern binary chemical munitions?

Ambassador STOESSEL. My view, Mr. Chairman, and I think this is a view of the Commission, is that the prospects would be lessened if we failed to proceed. We know, and I know from my personal experience with the Soviet Union, that the Soviets respect strength.

We are not going to get anything from them for nothing. We have to have an incentive for them to negotiate. The present situation is one where there is a gross asymmetry, a gross preponderance of Soviet strength in this field. They have no incentive to negotiate seriously.

I feel and the Commission feels that proceeding toward the production of the binary weapons would be an encouragement to achieving a ban.

Chairman GOLDWATER. I agree with you completely. I sat through several sessions of the Intelligence Committee last year. It was highly classified and it still is. I wish we could declassify the information so that we could give the American people a real idea of what we are talking about.

Now another question.

Would you describe for us the basis for the Commission's judgment that the deployment of binary weapons in Europe is not essential for deterrence?

Ambassador STOESSEL. Mr. Chairman, here again the essential thing to remember and keep in mind is the safety of these weapons and the ease with which they can be transported on airplanes, they can be transported on ships.

The present situation with unitary weapons is one where the Navy does not want to have unitary weapons on board the ships; it is simply too dangerous. Binaries would be a different situation.

That means that the munitions could be transported very rapidly in case of need to other countries where there was a requirement.

Chairman GOLDWATER. Now, the administration has not proposed that we demilitarize the entire existing stockpile of unitary chemical weapons.

Would you recommend that the Congress direct them to do so as part of a package that approves the production of modern binary weapons?

Ambassador STOESSEL. Yes. That would be our recommendation.

Chairman GOLDWATER. Do you think they would follow that recommendation?

Ambassador STOESSEL. I believe so, yes.

Chairman GOLDWATER. One more question.

What priority does your Commission think should be attached to the modernization of the U.S. chemical deterrent?

Ambassador STOESSEL. We would attach a very high priority to such action. Again the present situation is one where the Soviets have a great advantage. Their chemical capability is at least several times greater than ours, quite possibly many times greater than ours. This constitutes a danger to our forces, to the forces of our allies.

We also feel that modernization would represent an improvement in the deterrence against any use of chemical weapons and would also, as I say, be an incentive to the Soviets to proceed toward a multilateral verifiable ban.

Chairman GOLDWATER. Thank you.

Now, taking it in order of the attendance, Senator Denton, I think you came in next.

Senator DENTON. Thank you, Mr. Chairman.

I have been here since the beginning, Mr. Chairman. I have heard the summary and conclusions of the Commission and about two-thirds of the way through I heard your comments, and the comments of the Senator from Ohio, John Glenn.

Everything that has been said by them and by the Ambassador are agreeable to me. I should like to express my admiration for the Commission's thorough work, and my delight that the findings are as I hoped they would be.

So, Mr. Chairman, I will defer any further questions except to say hello to the Ambassador.

Senator NUNN. Mr. Chairman, I have one other question I would like to ask if we have an interlude.

Chairman GOLDWATER. Have you finished, Senator Denton?

Senator DENTON. Yes, I defer for the moment.

Chairman GOLDWATER. Senator Nunn.

Senator NUNN. Did everybody on your Commission agree with the findings?

Ambassador STOESSEL. Yes, they did.

Senator NUNN. Was it unanimous?

Ambassador STOESSEL. This was unanimous.

Senator NUNN. Was anyone of a different view when they started? Were there any changed views or had everyone been down this line, to begin with?

Ambassador STOESSEL. I would say that while on this issue, of course, most people had some kind of opinion, that the members of the Commission came to their task with an open mind and ready to take a fresh look at the situation.

Senator NUNN. There was nobody on the Commission that had opposed binaries before, either publicly or privately?

Ambassador STOESSEL. I am not aware that there had been opposition by any member.

Senator NUNN. The reason I ask this question is that I am in favor of producing binary chemical munitions. I agree with Senator Glenn and Senator Goldwater. I think it is absolutely ridiculous, and I think it is not only unsafe for our own personnel, but it greatly weakens our deterrence and maybe the most fundamental and basic flaw we have in the NATO strategy today—that is the absence of chemical weapons that are capable in an emergency situation in Europe which will certainly hasten the time we will have to use nuclear weapons.

That is the connection that I think ought to be stressed because chemical deterrence is like conventional deterrence. The absence of it means you rely more and more on the early use of nuclear weapons.

Those people who are most adamantly opposed to producing an adequate deterrent chemical capability had better realize that what they are doing is making the trigger on the nuclear weapons, in Europe particularly, more of a hairtrigger.

I think that is the essential bottomline of what we are doing. We are creating more danger in every respect by our present stalemate.

The reason I asked the question regarding about anybody changing their minds is because if you changed anybody's mind on the Commission, I want to know how you did it.

Ambassador STOESSEL. As I say, I am not aware of any opponents that were on the Commission, although they had an open mind and we heard pro and con from many witnesses who testified before us.

Our final conclusions certainly were very strong and unanimous.

Senator NUNN. For anyone who is against chemical weapons who goes carefully through our NATO war plans and looks carefully at what our options are and what the likely reaction of leaders are in any kind of showdown—I suggest that alone would change their mind.

Mr. Chairman, those are all the questions I have.

I want to thank you, Mr. Ambassador.

Chairman GOLDWATER. Senator Levin, I think you are next on deck.

Senator LEVIN. Thank you, Mr. Chairman.

I just want to pursue the question that Senator Nunn asked which I think is an important one in terms of the credibility given to this report.

As I understand the positions of the people on this Commission, looking down the list from what I know of their prior positions and reviewing it, there were many people on that Commission who had previously stated a position of support for chemical weapon modernization.

Is that accurate?

Ambassador STOESSEL. Some have. I believe the two former Congressmen, Mr. Conable and Mr. Erlenborn, previously had voted in favor of the binary program. General Haig, former SACEUR, had expressed the view that modernization was necessary. I am not

aware that others on the Commission had taken a formal position. I certainly had not. Others I believe had not.

As I say, even with the Congressmen and with General Haig, the disposition was to be openminded and to take a fresh look at the situation as presented by the witnesses before us and the work we did.

Senator LEVIN. Was Dr. Brzezinski on the Commission?

Ambassador STOESSEL. Yes.

Senator LEVIN. Had he not supportred modernization prior to this?

Ambassador STOESSEL. I am not aware of this specifically.

Senator LEVIN. Is it not true that the Executive Secretary of the Commission had taken a strong prior position in favor of modernization?

Ambassador STOESSEL. Yes, that is true.

Senator LEVIN. So, you had many members of the Commission who had taken a prior position in favor. You had an Executive Secretary who had taken a strong prior position in favor. You had nobody on the Commission who had taken a prior position opposed.

You had a letter, as I understand it, from Congressman Purcell asking that Congressman Bethune be appointed to the Commission to have some balance on the Commission which was absent, and you had the White House apparently rejecting that request from Congressman Purcell.

Do you know why the White House rejected the request which would give a little balance to that Commission?

Ambassador STOESSEL. No, I don't, Senator.

Senator LEVIN. You were not involved in that process?

Ambassador STOESSEL. No.

Senator LEVIN. I would like to ask the White House as to why they rejected Congressman Purcell's request that Congressman Bethune be added to the members of the Commission. They had many supporters of the modernization on the Commission.

Senator Nunn stated and the Ambassador acknowledged when they requested to add one opponent to the Commission to give a little balance, the White House rejected the request from Congressman Purcell.

I wonder if the committee would be willing to ask the White House what the reasoning was in rejecting the request from Congressman Purcell that Congressman Bethune be added?

Ambassador STOESSEL. The White House didn't ask me about it.

Senator LEVIN. Could we ask the White House as to what their reasoning was?

Chairman GOLDWATER. We will be happy to ask. I hope you are not unhappy with the answer.

Senator NUNN. I will join in the letter. I think it is a mistake, Senator Levin, not to put some opponents on this Commission because I believe that they would have been converted if they saw all the evidence and it would have strengthened the effect of this report.

I agree with the point you are making.

Senator LEVIN. I like to think that I would be able to read a report which I had some confidence in with an open mind. I would

like to live under that assumption. It makes it easier for me to function here.

When I get a report from a committee which obviously starts from a membership with a certain position, which has an Executive Secretary, as I understand it, Dr. Welch, who is the Deputy Assistant Secretary of Defense for Atomic Energy and Chemical Matters. He is the chief Pentagon spokesman for this particular modernization. He is the Executive Secretary of the Commission.

Senator HART. Could we have order in the committee?

Chairman GOLDWATER. Yes, we can. The committee will be in order, please. People can't hear.

Senator LEVIN. When you have a Commission which is set up that way with obviously a predilection going on in terms of its membership, you have a request from a Member of Congress to add one person to that Commission who has a different point of view and that request is not accepted apparently by the White House. I have to tell you the product of that Commission is not the product that is going to inspire a lot of confidence in me even though I have great admiration for the members of that Commission.

There are many members of that Commission I know personally and I have great admiration for those persons.

In terms of objectivity of the report coming out of the Commission, it is not the kind of report I am going to sit down with and feel that its sponsors came into the process with great objectivity. I am very, very unhappy, frankly, with the White House decision not to have at least one person of an opposing point of view on the Commission when it has many persons on that Commission and its Executive Secretary who starts off with a clear position in favor of the outcome of the report.

I will be happy to read the White House reasoning when the committee gets it back from the White House as to why Congressman Bethune was not appointed to the Commission or at least somebody on that Commission with an opposing point of view.

The only question I have, Mr. Chairman, is relative to our allies. That has been a troubling matter for me, frankly, in this whole area as to whether our allies will accept these weapons and store these weapons on their soil.

Did you talk to our allies about the storage issue and which ones will accept these weapons and which ones won't, because it does affect their military capability?

Ambassador STOESSEL. Senator, we did have discussions with a number of our allies and with representatives in NATO. As I said earlier, the question of storage of weapons in Europe in peacetime is obviously a very sensitive one politically for them.

We do have forward storage at present in Germany. That is the only place we have such storage. I think there would be opposition on the part of the NATO countries to peacetime storage.

However, as we found and as we state in our findings, we feel that with binaries, such forward deployment in peacetime is not necessary. That is one of the advantages which would be presented by the binary weapons.

Senator LEVIN. So, we have not asked them to store the weapons on their soil nor will we if we produce them?

Ambassador Stoessel. That is correct. We approached this from the standpoint that this should be a U.S. decision, U.S. production, U.S. storage.

We are not asking permission from the allies to do this. We are not asking for their consent to our action.

Senator LEVIN. Nor will we?

Ambassador STOESSEL. We will not.

Senator LEVIN. What have you talked to them about?

Ambassador STOESSEL. Pardon?

Senator LEVIN. What have we talked to them about?

Ambassador STOESSEL. We talked to them about what we were working on at the time. At that time when we were there in Europe, which was about a month ago, we had not yet reached our conclusions, but we received what we understood was the situation, the imbalance in the chemical field, the unitary versus binary.

We listened in particular to their views. I think it is fair to say that on the military side all of the members of NATO and the military feel there is a need for modernization. This was clearly expressed by the Chairman of the Military Committee of NATO, for example.

Senator LEVIN. How about the civilian side?

Ambassador STOESSEL. Here, there is a great sensitivity, as I say. I did note earlier that in West Germany there has been a West German white paper of 1983 which states very clearly that NATO should possess a reprisal capability for chemical warfare.

Senator LEVIN. Did we ask our allies for recommendations as to whether we ought to produce these, their advice? What did we ask?

Did we just tell them we are thinking about it or did we ask them whether we should?

Which ones were willing to state an opinion as to whether we should and which ones weren't willing? Of the ones that were willing, which ones said we should and which ones said we shouldn't?

Ambassador STOESSEL. I can't get into that. The confidential nature of the discussions would preclude that. I would say we had good discussions with the allies back and forth, pros and cons. We certainly had a feeling from them about the sensitivity of the issue.

Senator LEVIN. Is it fair to say some of our allies thought we should, without identifying which ones?

Ambassador STOESSEL. Yes.

Senator LEVIN. Is it fair to say some of our allies felt we shouldn't, without identifying each one?

Ambassador STOESSEL. No.

Senator LEVIN. We had some civilians that thought we should and some were neutral?

Ambassador STOESSEL. That is fair.

Senator LEVIN. Thank you.

Chairman GOLDWATER. Senator Quayle.

Senator QUAYLE. Thank you, Mr. Chairman.

You state in your report that one of our first goals was to pursue achievement of a multilateral and verifiable ban. I would like to concentrate on the words multilateral and verifiable. Multilateral means beyond the bilateral, beyond the United States and the Soviet Union.

In your research did you identify Third World countries, that presently have a capacity of offensive chemical warfare.

Ambassador STOESSEL. We looked into that. Certainly there are a number now, there has been a great increase in the number of nations having this capability.

Some of the information is classified. We know, of course, in the Third World countries Iraq obviously has a capability. They have used it. There are indications that a number of other countries do have such a capability.

Senator QUAYLE. Does Iran have a capability?

Ambassador STOESSEL. I am afraid I cannot respond on that.

Senator QUAYLE. You cannot respond?

Ambassador STOESSEL. That is right, on whether or not we know that they a capability.

Senator QUAYLE. Is that classified information?

Ambassador STOESSEL. That is right.

Senator QUAYLE. How about countries that have chemical warfare? Does Cuba have chemical warfare capability?

Ambassador STOESSEL. I am sorry, the same answer.

Senator QUAYLE. Let me read to you. This is "World Press Review." I don't think this has a classification.

It says recent reports allege chemical weapons have been stockpiled not only in major powers, but also in North Korea, Vietnam, Egypt, South Africa, Cuba, and Iraq.

Do you want to comment on this public report or not?

Ambassador STOESSEL. I am afraid I could not comment on it.

Senator QUAYLE. I would suggest, Mr. Chairman, sometime maybe we can do this in a classified session. It might be worthwhile.

Senator WARNER [presiding]. I would like to do that. There is a plan for a second hearing on this general subject and that hearing will be for the purpose of bringing in the geopolitical considerations of this weapon system.

At that time we anticipate there will be a classified and unclassified session of the hearing. The hearing should be within the next 10 days.

Senator QUAYLE. I would hope in that part of the hearing not only will we get classified information on the countries that have the capability, offensive capability, but I would like to see what Nicaragua has as far as chemical warfare capability.

I would like to see a full discussion and make public as much as possible what is going on in Iran and Iraq, if in fact they are using chemical warfare. We know Iraq has that capability. I think there is reasonable suggestion that even Iran may have that capability also.

If they do and they are using this, multilateral negotiations will be exceedingly comprehensive. The issue is exceedingly important for this committee to have all that information. It is something that we hope we can provide as much to the public as well.

I look forward to those hearings, Mr. Chairman, on that issue. I will encourage the committee to release as much as possible publicly. Senator Nunn said we are going to have to change a few minds around here to get modernization of our chemical arms going. This

may be one way to change a few minds, to indicate how widespread chemical weapons deployment is, that this is going on.

It is not a closet. They are being used. If we want to have credible deterrence, we will not only want to have safety, but have a plan on how we are going to deploy this type of weapon.

The second issue is verification, the verification capability. I note with interest in your conclusions that the Commission believes that:

> The U.S. intelligence gathering analysis regarding chemical warfare activities of the Soviet Union and other countries should be greatly improved.

I construe that as a euphemism for the fact that our intelligence-gathering capabilities are not adequate at this particular point.

Did your Commission look at the verification capabilities and intelligence-gathering capabilities in our own Government and would you comment on them, please?

Ambassador STOESSEL. I think all I can say on that is that in the course of our hearings and investigation we found that intelligence on this whole subject worldwide is not as good as it should be. Of course, you never have enough intelligence. You can always make improvements. But particularly in this field we feel that a stepped up activity would be useful.

Now, we did not focus particularly directly on the details of the multilateral negotiations in Geneva and the requirements for verification, and so on. We had some briefings and discussions with the people in the Arms Control and Disarmament Agency who are responsible for these negotiations.

Clearly verification with a multilateral ban will be a big problem. This, indeed, is perhaps the major sticking point with the Soviet Union on achieving a ban because we insist on verification and the Soviets have been resistant to adequate verifications measures, particularly on-site verification measures.

We do have the feeling, as we said in the report and as I said earlier, that as we acquire a more modern capability, this could be an incentive to the Soviets to negotiate more seriously on this subject.

Senator QUAYLE. Isn't it true that if, in fact, you are going to have a ban on any type, that verification is of critical importance?

Ambassador STOESSEL. It certainly is.

Senator QUAYLE. If you have a complete ban, verification is far more important than if you are going to limit certain amounts that you are going to have?

What you are saying right now in this conclusion is that we don't really have the intelligence capability right now and, therefore, we will have to enhance those capabilities to have verification?

Ambassador STOESSEL. That is true. I think our reference to intelligence there is to the present situation where there is no onsite investigation possibility.

Now, any ban which would be acceptable to the United States I think would have to contemplate intrusive types of inspection. Of course, that would in a way take care of many of the problems which we allude to under the heading of intelligence.

Senator QUAYLE. We still have, and I know the chairman knows it, the committee still has coming from the administration a report concerning or intelligence and verification capabilities within the adminstration. It is overdue. Hopefully, it will come up soon.

I would imagine the administration will probably find what you found, that we simply do not have the capability that we need and, therefore, our intelligence gathering and verification will have to receive more attention.

Mr. Chairman, I look forward to the other hearings that Senator Warner was talking about. I think the fact that Iraq is, in fact, using chemical warfare is exceedingly interesting to me. I think we should look to see what kind of chemical warfare capability we have in our own hemisphere.

I know the chairman's point of view that we should declassify as much as we possibly can. It does not do us any good in fighting the battles on the floor of the Senate, to say, "We can't talk about that. If you had the information I have, Senator, you would vote for it."

Chairman GOLDWATER. I think this will satisfy the entire committee. If there is no objection, I would like to invite the committee to the repetition of the testimony we heard last year before the intelligence Committee on the whole subject of chemical warfare because this does not even touch the surface.

If you don't have any objection, I will set the wheels in motion now to schedule a closed hearing on the subject. If the American people could hear the testimony, it would really scare them.

Senator QUAYLE. I thank the chairman. I hope we can get as much of that as possible out of the closed session into the open session.

Chairman GOLDWATER. Senator Kennedy is next.

Senator KENNEDY. Thank you, Mr. Chairman.

I want to join in welcoming the Ambassador to the committee. I think all of us are very mindful, Ambassador Stoessel, of the very extraordinary career that you have had in representing our country in a variety of different responsibilities. I think we know of your long continuing commitment to public service and we are grateful for your continued involvement.

Ambassador STOESSEL. Thank you.

Senator KENNEDY. There has been, as has been mentioned by other members of the committee, concern about the makeup of the Commission and the procedures which were followed. I think you can understand why this Commission was established and the importance of its work.

This issue involving chemical warfare arouses enormous emotion among American people and people all over the world. We are talking about a really divided U.S. Senate, Members who want to make the right judgment in regard to the security interests, and also understand the awesomeness of the potential use of chemical weapons in any kind of conflict.

So, there is certainly the hope by many of those who understood that this Commission was being established, that it might be able to shed some new information, some new light on this issue, so that both Members of the Senate and House, and the American people would be able to have a keener awareness and understanding of the various issues which have been raised, both by not only this

committee and other committees of the Congress and Senate, but in the floor debate.

I think the Scowcroft Commission which was estabished might agree or differ with some of the recommendations, but I think that all of us felt that this was a very serious effort by serious individuals who gave a great deal of attention to the questions before it and made some recommendations on some very important matters, I think quoted as an authoritative instrument for the debate in the Congress, the concern that many of us have is to the makeup of the Commission.

You have gone into that. I don't think there was any person appointed to it who expressed opposition to the chemical warfare review. We have not had a report. It has not been drafted, as I understand.

We have as part of the record a request by Mr. Ronald Bee who was a representative of Palomar Corp., one of the consultants, that indicated he was going to make recommendations as to what the European attitude would be and his meetings were scheduled for the end of last week in this document.

I don't know what consultation was available to your Commission in terms of assessing European attitudes. It is well understood that the Germans, for instance, gave it a very low priority because of their very deep concern that if they had either consultants of your Commission or other responsible individuals, it might be perceived that they were actively considering a favorable recommendation.

We know that. We understand that, some of us who had the opportunity in the confidential discussions with leading German officials who have very significant responsibility in the defense area have given us very different viewpoints certainly in regard to Germany.

Yet the Commission still has decided to come forward at this time. I think there will be those who say that this three-page document that was really developed Wednesday and Thursday of last week, approved by the White House on Friday, as I understand, is really in response to the fact that we will be debating this issue in the next week or so on conclusions of the budget considerations.

I think there has been an appropriate sense of skepticism with regard to some recommendations.

There is also a rather extraordinary development and that is hiring of Hannaford & Co., a public relations organization.

How much of the taxpayers' money is going in to pay for a public relations group? Can you tell us that?

Chairman GOLDWATER. When did the Senator hear that?

Senator KENNEDY. Just in my briefing document. If it is not so, I will be glad to be corrected.

I suppose the first question is: Have you hired Hannaford & Co.?

Ambassador STOESSEL. Senator, yes, that is true, they were hired. I am not aware of the exact financial arrangement. We will be glad to provide that for you.

The total budget for the operation of the Commission, its travel, and so on, is some $174,000. I understand that Hannaford is being paid the usual Government consultant fee. It was felt that some as-

sistance probably would be necessary in terms of dealing with the press, and so on. That is why they were hired.

Senator KENNEDY. What is their function? What is the public relations firm's function for a Commission established by the Congress which is meant to provide a report to the Congress?

What is the function of this public relations firm?

Ambassador STOESSEL. It was largely, as I say, to take care of inquiries from the press, to arrange for attendance by the press at our various sessions, our open sessions, to arrange for contact with the press on the part of the Commission members, in a sense, guidance by them.

Senator KENNEDY. Did it occur to any members of the Commission that this is a rather extraordinary use of the Commission funds to hire a public relations outfit, evidently to promote its recommendations?

I don't know of another Commission which has been established—I used to be chairman of the Administrative Procedures Committee in the Judiciary Committee and we had extensive hearings about Presidential commissions and what happened to those recommendations in comparison to what the British do when they establish a royal commission, there has to be reaction by the Parliament.

We had a very extensive series of hearings on commissions. We have had in excess of 20 of them in the past probably 15 years. Some have had very positive results, the Marshall Commission recommending random selection for draft which has been implemented.

By and large, they haven't been—I don't know of a single instance where we have ever had a public relations firm hired at taxpayers' expense to promulgate the recommendations.

If you can supply what we are spending for that particular function, I would certainly welcome it.

[The information follows:]

Ambassador STOESSEL. I'd like to clear up one point of confusion. The Commission has not retained the Hannaford Company to prepare materials as suggested.

Two private consultants were however asked to furnish legislative and public affairs liaison services. These services have included answering written and telephonic requests for information from both the media and the offices of Members of Congress; arranging meetings with media and congressional representatives for the Commission and its staff; preparing legal and historical background of the Commission and its work for dissemination to the media, the Congress, and the public at large; and in general performing the kinds of counsulting functions one might expect to receive from individuals of their background and practical experience. Retaining consultants of this calibre is a normal procedure for Presidential Commissions of this type, as was the case in the recent Scrowcroft and Kissinger Commissions.

Let me just get to a final point because my time is running.

One of the matters that you spoke to this morning is the fact that we would retain the munitions here in the United States and deploy them in Western Europe or where needed.

I didn't see any reference in your three pages about the capability that we have within the services for such deployment. I think this has been an area which I, quite frankly, think we have not paid great attention to in the areas of priorities under even this

budget for past years, the sealift and airlift capability. We are very limited, more limited in that area than we are in many others.

I am just wondering because there is no reference to that particular capability and what would be available, given some conflict, whether it be in Western Europe, and what sort of priority this would have, some observations about how the weapons would be distributed once they arrive in, say, Western Europe.

Will we get a recommendation on that? Because it seems to me that has to be addressed or otherwise the idea of retaining these weapons here in the United States, if we are not able to get those deployed, probably makes very little sense.

Ambassador STOESSEL. Senator, I will say that at least some of those questions will be answered in the final report which is under preparation now and will be forwarded and made available in the very near future.

Senator KENNEDY. Not in time, I guess, for the debate?

Ambassador STOESSEL. Well, that is one of the problems. It is a mechanical problem here of printing it up and getting it distributed. That is why we wanted to come before you with our thoughts which, as I say, are unanimous as reflecting the views of the Commission, so that you would have them before you.

On the question of deployment in time of need——

Senator KENNEDY. Could you supplement your own testimony with that aspect of the report in terms of this issue so that it would be available to us?

Ambassador STOESSEL. Yes; I will be glad to do that.

[See appendix 1, p. 35.]

As I said earlier, it is obvious that these binary weapons would be much safer to transport. They could be placed on ships.

Senator KENNEDY. My concern is do we have the ships and planes?

Ambassador STOESSEL. Actually, the space to be taken by binaries would be much less than present unitary weapons if that were ever in question. I think detailed plans for transport and deployment would have to await actual availability of weapons. This, under the best of circumstances, is several years away.

Senator KENNEDY. I want to thank you very much, Mr. Ambassador, for responding to these questions. Again, I want to say how much I respect your service to our country.

Ambassador STOESSEL. Thank you, sir.

Chairman GOLDWATER. Senator Warner.

Senator WARNER. Thank you, Mr. Chairman.

Mr. Ambassador, I join my colleagues on the committee in expressing a personal appreciation to you individually and collectively, to the Commission and its members. I think you will have provided an invaluable work product for the consideration of this particular issue by the Congress.

If I might get the attention of my distinguished colleague from Michigan, I testified before this Commission last week. I assure all members of this committee that I was received as a witness and questioned and cross-examined vigorously on a variety of issues. There was no partiality shown to me by the commission and their questions were very perceptive and in depth.

Indeed, I think two members expressed some disagreement with some of the issues that I stressed.

I would like, first, to read from a recent press report, and I am quoting:

"The Soviet arms export policy is an important factor in this threat of chemical weapons among Third World countries," an expert in the field said yesterday. "Some hard-liners say the Soviet Union is the total cause of the proliferation problem," said Brad Roberts, a fellow in international security studies at the Georgetown University Center for Strategic International Studies.

Roberts, a former arms control and defense policy analyst in the Congressional Research Service, said he takes a more modern view, but he nevertheless blames Soviet export of military items and clothing equipment for chemical warfare for creating an infrastructure in many Third World countries that encourages use of the dread weapons.

That is a quote in the Washington Times by Tom Geer.

The point I make is that we focus so much of our attention on the NATO arena, but we should not lose sight of the fact that elements of our Armed Forces are deployed throughout the world. This is a credible representation of what is taking place, at least I happen to believe it is.

I hope this committee will provide a record for the Senate as a whole that is a credible disclosure of Soviet policy, and one that shows that we have to not only take into consideration the NATO region, but other areas for possible deployment in response to contingencies.

Against that background, I draw to your attention, Mr. Ambassador, that in the administration's budget request there is a request for $936 million—that is almost $1 billion—for protective equipment.

It seems to me that that investment is substantially enhanced if our deployed troops also have a credible deterrent in the form of the binary system.

My question is: Do you believe it is an enhancement of that substantial investment in defensive equipment to have the addition of a binary system?

Ambassador STOESSEL. Yes; I certainly do, Senator. I think the deterrent is made up of two parts. One is defensive and one is offensive. We have to have both to have a credible deterrent.

Senator WARNER. I view both as being defensive and a deterrent, the binary system as well as the clothing.

Ambassador STOESSEL. That is a better way to put it.

Senator WARNER. This is a very substantial item in the defense budget and as such it will grow in the coming years as I project the need for this equipment.

While there is serious question about the usefulness of it in the face of some of the known chemical weapons, nevertheless we must as a Nation give our men and women in the Armed Forces the best possible equipment to defend themselves, not only by virtue of their protective clothing, but the binary deterrent system.

That leads me to the second point. It is a very general observation.

It seems to me to be a point of fairness that we, the Government of the United States, the President and Commander in Chief, and the Congress are required under the Constitution to provide for the Nation's national defense. In that context, at times this involves

sending men and women abroad in areas where they are in jeopardy and indeed sometimes in actual combat roles. There is an element of fairness involved in that responsibility that requires that we send them forth from these shores equipped as well as possible to defend themselves.

The absence of this binary deterrent system to me is an absence of the element of fairness to those people as individuals.

Do you share that view?

Ambassador STOESSEL. Yes, I do very much, Senator. That is very well expressed.

Senator WARNER. Finally, the questions addressed by my colleague from Indiana, Mr. Quayle, lead me to believe that in the work of the Commission you dealt with a considerable amount of classified material and that you should consider adding to your report a classified section for use by the Congress and others having a security clearance.

Has that been given any thought?

Ambassador STOESSEL. Yes, it has, Senator, and that would be our intention.

Senator WARNER. So, you will have both a classified and unclassified version?

Ambassador STOESSEL. That is correct.

Senator WARNER. Mr. Chairman, that covers the points I had.

Chairman GOLDWATER. Senator Hart.

Senator HART. Mr. Chairman, thank you very much.

Ambassador Stoessel, let me see if I can summarize where we stand. In the last defense authorization bill the committee requested that the President appoint a Commission which would report back to him no later than April 1 of this year on a range of questions having to do with the adequacy of our chemical policy.

Thereafter at some point a commission was formed composed, for all practical purposes, exclusively of those who are already on record as supporting the production of binary chemical weapons.

Then a staff was made up, and correct me at any point if I am wrong, the staff of the Commission was comprised largely of two groups, members of the Chemical Corps on loan from DOD and members of a consulting firm, Palomar, which apparently has had a series of DOD consulting contracts on chemical weapons matters over a number of years.

The executive secretary of the Commission is Dr. Welch, Assistant Secretary for Chemical Matters for DOD.

The Commission has spent somewhere in the neighborhood of $200,000 and has retained, I think it is fair to say, an expensive public relations firm Hannaford & Co., to do unspecified duties, including at least handling the press, and, I am told contacting various congressional staff to ask them what questions Members of Congress might ask at hearings like this.

That contacts have been made with allies whose identities we are not yet free to know, both military and civilian, but that further, I am told, contacts have been made with European leaders that would result in setting up meetings in May with those leaders. That may or may not be the case, but that is what I am led to believe.

And finally, now on May 1 we are given findings which essentially ratify present administration policy but no report as such is available and none will be made available to us until after the deliberations in the Senate.

The findings themselves seem to be summarized as follows:

That our present policy is all right;

That in general our allies are onboard on this even though we don't know who specifically they are and we don't know whether they were asked the specific question of how they felt about deployment of binary weapons on their soil;

And that, finally, on the very difficult, complicated questions of deployment of these weapons, how we deploy in time of crisis, let alone actual hostility, that essentially the Commission found that we could do so and that Congress is just left with that conclusion.

Is that a fair assessment of where we stand?

Ambassador STOESSEL. I would have to disagree with some of your remarks, Senator. You have covered a lot of territory there.

I would, in response to some of your statements, note that first with regard to the time issue, the President was directed to appoint a Commission. I think that was back in January and the Commission was to report by April 1.

Actually the Commission was not appointed until March 11. So, we got a late start, and knowing the schedule on the Hill, we did feel under time pressure and that is why we have come forward at this time with some findings so that you would have the benefit of our thinking on the subject.

The final report will be consistent with these findings, will have more extensive treatment of many of the subjects and should be available very soon.

On the staffing, it is true that our staff is drawn from the Department of Defense. I think this makes sense just from the standpoint of efficiency, if nothing else.

The bulk of the subject matter has to do with military considerations. We did need a great deal of expert advice. So, it was helpful to have staff readily available. It made sense to take staff from the Department of Defense.

The position of the executive secretary has been mentioned. I would just say that this position was exactly what the term implies, an executive secretary. The executive secretary did not influence the deliberations of our committee.

As far as the expenses are concerned, as I mentioned, the total budget is $174,000 for the Commission. I am not aware that this is excessive for a Commission of this kind. I don't think we have spent all of that as yet.

Senator HART. I did not suggest it was, Mr. Ambassador.

Ambassador STOESSEL. I am not aware of any projected meeting in May with our allies. This is the first time I have heard of that. I am not aware that anything of that kind is contemplated.

We did not want to imply in any way that our allies are onboard on this. As I said, our view is that this should be seen as a U.S. decision, U.S. production, U.S. storage. We are not asking the approval of allies for what we recommend.

We feel it is in the interest of the United States and also of the allies if we go in this direction, but we are not asking that they give their prior consent.

We did have consultations with allies on this subject. We mainly were in a listening mode and trying to inform ourselves, but it was not a question of asking for their consent.

Those are some of the comments I wish to make.

Senator HART. None of which I think dispute the factual analysis that I tried to summarize.

Could you provide on a classified basis the names and titles of representatives of allied governments that the Commission met with?

Ambassador STOESSEL. Yes, we could. We will be glad to do that.

[See answer to question submitted by Senator Levin, p. 31.]

Senator HART. To what extent did the staff and/or the Commission get into the details of deployment, air and sealift capacity, quantities of carrying capacity, both air and sea, and what competition there would be for that capacity for personnel, and ammunition, and medical supplies, and other supplies that might need to be deployed in Europe by sea or air in time of either crisis or conflict?

Ambassador STOESSEL. Senator, we did look into that. As I said, the whole program is something which will not come to fruition for a number of years in any case.

I cannot say we went into great detail on actual lift capacity and space requirements, and so on. It seemed clear to us that the advantages provided by the binaries for safety of transportation and handling, also less space requirements because of the safety features of these munitions, would make it a very reasonable proposition that they could be accommodated on air and sealift.

They could also be positioned on aircraft carriers, which is not the case at the present time.

They could also be transported by fighter bombers.

All of these seemed to us to be persuasive reasons to feel that deployment in time of need could be very rapid.

Senator HART. In other words your argument is that because of the nature of these weapons as opposed to unitary weapons, there are more types of aircraft and ships that could carry them?

Ambassador STOESSEL. That is correct.

Senator HART. Finally, Ambassador, on the issue of defensive measures, you concluded, and I think correctly so, the protective measures alone cannot offset Soviet offensive capabilities.

I am not sure of anyone who argues that they can.

You further find that defensive equipment, even if it works, severely handicaps the personnel who wear it, and so on.

I hope there is not an argument or a finding against protecting our forces because I don't think any serious battlefield commanders argue that we should prepare to use binary weapons or any other kind of chemical weapons if our troops are not prepared to survive in that conflict.

Ambassador STOESSEL. Certainly not; defensive equipment is needed and certainly improvements in defensive equipment, detection and sensors, is required. We feel strongly that there should be, if anything, increased effort to improve the defensive equipment.

But we were very impressed by the extent of degradation of performance by personnel in protective garb. We do feel that it is necessary to have the offensive capability to provide a deterrent for use by the adversary of the chemical munitions.

Senator HART. But really that is not going to be a credible deterrent if the adversary knows we are not prepared to survive in that environment, ourselves; is that true?

Ambassador STOESSEL. That is true.

Senator HART. So, defensive must go with offensive?

Ambassador STOESSEL. Very definitely.

Senator HART. You found that we had or did not have adequate defensive measures now?

Ambassador STOESSEL. I hesitate to say adequate. We have very extensive preparations and training in protective modes. Improvements clearly could be made and should be made, but we were favorably impressed by the extent of our effort in present circumstances with regard to defense.

Senator HART. That is an important finding because most of the testimony we have heard is that we were well behind the Soviets in the protective or defensive area.

In fact, members of this committee have been very critical of the Army and the entire DOD for not moving faster on preparing our own forces to protect themselves.

Ambassador STOESSEL. My understanding is that as far as suits are concerned, masks, and so on, that we probably have better equipment than the Soviets.

In other elements such as equipping tanks, personnel carriers, and so on, with filters and systems which would prevent the intrusion of chemical agents, we are behind. That needs improvement.

Senator HART. Thank you very much.

Senator WARNER [presiding]. Senator Exon.

Senator EXON. Thank you, Mr. Chairman.

Mr. Ambassador, I should like to emphasize what I think is extremely important in your report, which highlights as far as I am concerned what we have to get across to the people in general, and that is that the great advantage of the proposed binary munitions is safety. That is from your report.

The report goes on to say:

> The projected binary munitions program will not produce a more lethal generation of weapons. It provides rather a safer, separate packaging of nonlethal chemicals that combine to form lethal agents only when launched. The agents which would be formed after launching are "identical"—I emphasize the word "identical"—to the lethal agents already produced and stored in the U.S. stockpile.

Given what I am convinced is a continued Soviet buildup in this particular area I really believe once again we have a major threat from the Soviets. It has been somewhat of a mystery to me that a sizable segment of the American public accept the buildup of nuclear devices for deterrence, but somehow rise up in righteous indignation when we talk about deterrence in chemical warfare, which I think is equally important. Indeed, I see chemical weapons as more of a conventional warfare, rather than nuclear warfare problem.

My question, though, is a followup to what Senator Hart was talking about.

What is your view as to how we are moving ahead on modernization of chemical deterrent?

I am concerned about the protective measures for our forces. Based on the Commission's efforts, how would you rate the protective training as of now of our personnel, particularly the rear guard troops such as depot and cargo handling units, support units and so forth?

Are training efforts currently in effect for the Reserve personnel and the Guard which would play a key role in case we had a real crisis in the conventional area?

On a day-to-day basis is chemical protective gear readily and quickly available, especially at key communications and command facilities?

Did the Commission make any recommendation specifically in areas that I am referring to?

Ambassador STOESSEL. Senator, I will say again we were favorably impressed with what we heard about the efforts going into this. A substantial proportion of the funds which have been appropriated in the past and which are being requested go for defense, some 70 percent or more for defense. Training seems to be good.

On your question about Reserve forces, depot personnel, and so on, yes, there is defensive equipment available to them. Improvements can always be made and we obviously need improvements in the sensing devices to sense the presence of agents.

There could be improvements in the type of gas mask, and so on. R&D is going on for that.

Basically, I think the program is a good one.

Senator EXON. Specifically, what about the Guard and Reserve units?

Ambassador STOESSEL. Yes, my understanding is that there is training, there is protective gear available.

Senator EXON. What you are saying is that, generally speaking, you think we are on the right track in this whole area of preparing for such an eventuality but we need to do more?

Is that the bottom line?

Ambassador STOESSEL. Yes, I think that is true. As we say, and as Senator Hart said, I don't think anyone could reasonably expect you could depend entirely on defensive measures. That would be the incorrect assumption.

But it is a very important element and we have it in place. Improvements can be made, but we also feel we need the other side which is the modernization of the retaliatory capability.

Senator EXON. Thank you, Mr. Ambassador.

Thank you, Mr. Chairman.

Senator WARNER. Mr. Chairman, if I may make one further observation.

We have talked extensively this morning, and quite properly so, on the question of equipment for individuals. I hasten to point out that the U.S. Navy in its design of ships has not made a similar effort, and that was a calculated risk that we accepted in the Navy. We did not design any ships to enable them to be effective fighting combatants in a chemical environment.

Indeed, I think the testimony of all naval commanders is that they would have to issue orders of a retrograde movement, to use

an old phase, in the event they were confronted with a chemical environment.

Is that not correct?

Ambassador STOESSEL. Yes, that is correct.

On the other hand, the new Soviet ships and equipment are properly provided with defensive equipment against chemical warfare.

Senator WARNER. I thank you, distinguished Chairman of this Commission.

I think the Congress is hiding behind the horror of this subject and is not facing up to its responsibility.

Chairman GOLDWATER. The only way the Navy can avoid it is full speed ahead.

Senator WARNER. It all depends in which direction they are heading.

Chairman GOLDWATER. Mr. Ambassador, I can't thank you enough. I don't think you have any concept of the interest of this committee. We have people who are opposed, but the majority are in favor.

We feel our biggest job is going to be to alert the American people to the real danger that exists in this field. Anything you can do that will influence the President to get the intelligence family to declassify information on this subject—I mean completely—so that the American people can understand it. We are confronted with some potential offensive chemical agents against which there is no defense. That is the kind of help we are going to need.

I want to thank you again for being with us this morning, and your entire staff. You have done a fine job.

[Questions with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JEREMIAH DENTON

Senator DENTON. Will our allies in Europe be satisfied in a situation in which the United States has the sole retaliatory capability, and it is stockpiled in the United States?

Do any of our allies now have a retaliatory capability, or do they intend to get one?

Ambassador STOESSEL. The decision to modernize our chemical munition stockpile and to store them in this country is solely that of the United States. It is my view that this would be acceptable to our NATO allies. Indeed, it is clear that many allies, recognizing the need for chemical warfare retaliatory capability, look to the United States to provide such a capability.

As stated previously, the Commission found that it would not be essential to station binary weapons in foreign countries because they can be transported rapidly and safely from the United States.

It is the Commission's understanding that the United States has the only NATO chemical retaliatory capability; however, we were led to belive that France could, if necessary, quickly produce a retaliatory capability. It is also the Commission's understanding that no NATO ally has any intention in the near future of acquiring a chemical capability.

QUESTIONS SUBMITTED BY SENATOR CARL LEVIN

Senator LEVIN. Ambassador Stoessel, you stated that the Commission spoke with representatives of our NATO allies. Specifically what governments did the Commission meet with? Who, in each country, did you talk with? What is their position in the country's military or goverment? Who met with them on behalf of the Commission? What were the dates of the meetings?

Ambassador STOESSEL. During the last week in March, Commission members, Mr. Conable, Mr. Kester, Mr. Bakes, Mr. Erlenborn, and myself visited Europe to discuss

with a number of our allies, and with representatives in NATO, the work the Commission had undertaken. Our goal was that of a fact finding endeavor. The visits included stops in England, Germany, France, and Belgium. In Belgium we met with NATO Permanent Representatives and the NATO Secretary General. In the other countries, we met with high-level government officials as well as military representatives and commanders. On the military side, all of the NATO members feel a need for modernization. On the civilian side, we found there was great sensitivity in discussing the issues, although all civilian representatives we met with subscribe to the view that NATO should possess a chemical warfare capability. However, our allies see it to be counter-productive politically to engage in open discussions of chemical weapon modernization, particularly since, up until this time, the United States has not been able to resolve this issue itself. Generally, the modernization of U.S. chemical weapon stocks is viewed as matter for the United States to decide.

Senator LEVIN. In your statement, you state that the Commission believes that modernization would be likely to increase the chances of achieving a ban on chemical weapons.

What hard evidence do you have of this—any Soviet intelligence, etc.?

Do our NATO allies share this view? Have you asked them?

Ambassador STOESSEL. In the 16 years since our unilateral cessation of chemical weapons production we have made no progress with the Soviets in achieving a verifiable ban on production of such weapons. At times, when the U.S. seemed to be approaching a decision to modernize, the Soviets showed more interest (e.g., Gromyko's speech to the United Nations General Assembly in 1983), but then they backed away when our program failed to materialize. In the absence of a U.S. decision to modernize, the Soviets have no incentive to negotiate seriously.

Discussions with NATO countries confirmed the high priority they attach to achieving a ban on chemical weapons. Many felt that modernization on our part would contribute to this objective. The British Government, in particular, expressed such a view.

Senator LEVIN. It has been reported that there has been some progress on on-site inspection issues with the Soviets at the chemical talks. If so, and since this comes without binary production, doesn't this contradict your position?

Ambassador STOESSEL. The Soviets have agreed "in principle" to international observation of the destruction of declared CW stocks—that is, of the stocks that they would be willing to admit they possess. The Soviets still unfortunately reject even the concept of verifying the accuracy and completeness of their stockpile declarations. Nor are they willing to allow any inspections to check whether declared production facilities are destroyed or whether the facilities declarations are true. Even though the Soviets have acknowledged that some international inspections are necessary, they remain closely tied to their long-standing position that verification should be accomplished through each state's inspection of itself. A major change in their approach must occur before a convention is possible.

If there is ever going to be an effective ban on possession of chemical weapons—a ban in fact and not merely a declared ban—states will have to commit themselves to demonstrate to others that they are abiding by it. This requires some sacrifice of secrecy. The Soviets, as is well known, value secrecy very highly, and especially in military matters. They cannot be expected to make any such sacrifice if they can get the benefit of a CW ban anyway. If the United States perpetuates its 16-year moratorium on CW production, we will in effect be disarming ourselves unilaterally in this field through the natural deterioration of our stockpile. Under the circumstances, there is no realistic prospect that the Soviets would agree to an effective treaty banning CW; they will not pay for what they can get for free.

Senator LEVIN. Why won't congressional approval of binary munition production hand the Soviets a propaganda victory, upset European public opinion and their governments and make achievements of important NATO defense initiatives more difficult.

Ambassador STOESSEL. Soviet propaganda will undoubtedly attack United States attempts to modernize, regardless of the specific area or system. The Soviets also deny their use of chemicals in Afghanistan against unprotected people.

Commencing binary production is a prudent step which is necessary to meet real security needs of the United States; Soviet efforts to score propaganda gains because of our action will ring holiow in the face of the huge Soviet chemical warfare capability and demonstrated willingness to use it. Our European allies acknowledge the need for a chemical retaliatory capability to deter chemical warfare, e.g., the 1983 Federal Republic of Germany White Paper. The majority of Europeans should understand that modernization provides a safer and more effective munition to deter chemical warfare.

If Congress refuses to support U.S. CW modernization, the Soviets need not conclude a CW treaty to get the benefits of such a treaty. Modernization is not a "bargaining chip" but without it there will be little hope of arms control in this area.

Senator LEVIN. Ambassador, please submit copies of all press releases put out by the public relations firm, Hannaford Company, for the Commission and any other arrangements they handled.

Ambassador STOESSEL. I'd like to clear up one point of confusion. The Commission has not retained the Hannaford Company to prepare materials as suggested.

Two private consultants were however asked to furnish legislative and public affairs liaison services. These services have included answering written and telephonic requests for information from both the media and the offices of Members of Congress; arranging meetings with media and congressional representatives for the Commission and its staff; preparing legal and historical background of the Commission and its work for dissemination to the media, the Congress, and the public at large; and in general performing the kinds of consulting functions one might expect to receive from individuals of their background and practical experience. Retaining consultants of this caliber is a normal procedure for Presidential Commissions of this type, as was the case in the recent Scrowcroft and Kissinger Commissions.

Senator GOLDWATER. If there are no other comments, the hearing will stand adjourned.

Ambassador STOESSEL. Thank you, Mr. Chairman.

[Whereupon, at 11:40 a. n., the committee adjourned, subject to the call of the Chair.]

APPENDIX 1

Report of the CHEMICAL WARFARE REVIEW COMMISSION

JUNE 1985

CHEMICAL WARFARE REVIEW COMMISSION
Washington, District of Columbia

June 11, 1985

The President
The White House
Washington, D.C.

Dear Mr. President:

The Chemical Warfare Review Commission established by the Congress and appointed by you has held an intensive series of meetings and field visits during the past three months. The Commission has concluded its review and our report is forwarded herewith.

It has always been difficult to deal with chemical weapons issues. There is an almost universal revulsion felt on the part of all peoples towards these weapons. This revulsion, however, has not prevented the proliferation of these weapons and their authenticated use in several current conflicts. The Soviets have achieved, quantitatively and qualitatively, the world's greatest offensive chemical capability and fully integrated it into their military forces. At the same time, they have demonstrated an unwillingness to negotiate constructively on a verifiable chemical warfare ban. These developments mean that the restoration of a United States chemical deterrent cannot be ignored.

The Commission carried out an extensive review of every aspect of this complex subject, including the history and current status of efforts to achieve a ban on chemical weapons; the history of chemical warfare and of U.S. policy on chemical

matters; the nature of modern chemical agents involved; the technology of both munitions and defensive measures; the demilitarization of obsolete and deteriorating munitions; the nature and magnitude of the Soviet threat; and the design and development of binary munitions. We heard presentations by more than 75 persons representing a broad spectrum of opinion and many areas of expert knowledge. Commission members traveled to Europe, and spoke with U.S. commanders, men and women of our Armed Forces, and representatives of our allies. We have also viewed a portion of the current stockpile and other facilities in the United States.

In brief, we found that modernization of the U.S. chemical weapon stockpile would not impede and would more likely encourage negotiations for a multilateral, verifiable ban on chemical weapons; that only a small fraction of the current stockpile has deterrent value, while the bulk of it is militarily useless and should be destroyed; that the proposed binary program will provide an adequate capability to meet our present needs and is necessary; and that any expectation that protective measures alone can offset the advantages to the Soviets from a chemical attack is not realistic.

Authorization of the binary program will soon be debated and voted on in Congress. We are conveying these findings and recommendations to you at this time, so that Congress may have the benefit of our review and thoughts on this matter.

Respectfully,

/s/ WALTER J. STOESSEL, JR.

Walter J. Stoessel, Jr.
Chairman

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Former Ambassador and Under Secretary of State

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This Commission was appointed by the President of the United States early in March, 1985, and began work immediately. In the subsequent months members of the Commission held both open hearings and closed sessions to receive classified data, and heard from a total of 77 witnesses. Public meetings were advertised in the *Federal Register*, and in addition the Commission on its own initiative contacted persons and groups known to have views on this subject and invited them to appear. Many did so. Witnesses included persons both opposed to and in favor of the binary weapons modernization program. No one seeking to appear before the Commission was turned away.

Members of the Commission also traveled to see at first hand the subject matter of this report. Members visited the U. S. Army Depot, at Pine Bluff, Arkansas; the U.S. Army Depot Activity, at Umatilla, Oregon; the U.S. Army Research Laboratories at Edgewood Arsenal, Maryland; the Lexington-Blue Grass Army Depot, at Lexington, Kentucky; the Tooele Army Depot, at Tooele, Utah; the Newport Army Ammunition Plant, at Newport, Indiana; the U.S. Army Depot at Pueblo, Colorado; Dugway Proving Ground, Utah; Spangdahlem Air Force Base, Germany; U.S. European Command Headquarters, Stuttgart, Germany; U.S. Army installations in Germany; and a storage site in Europe. Members met also with officials of several foreign countries and with a number of both senior and operating level U.S. government officials, both military and civilian, from Cabinet level down. The Commission received intelligence briefings from the Central Intelligence Agency and the Defense Intelligence Agency. Members also reviewed selected items in the published literature on this subject, and both classified and unclassified government documents.

The report transmitted herewith is the product of the Commission's own effort. It was written, revised, and edited by the Commission members themselves in the course of numerous meetings, and reflects their own conclusions. All of the members put aside any

previous opinions on the subject of chemical weapons and addressed the subject freshly and in far greater detail than they ever had before. All found the process instructive.

Approaching with humility a topic so wide-ranging, the Commission nevertheless is confident that it has considered the subject in depth, and that the conclusions reached here are sound.

EXECUTIVE SUMMARY

By the terms of its 1975 ratification of the Geneva Protocol of 1925, and by its policy since World War I, the United States is committed not to use chemical weapons except in retaliation for a chemical attack on U.S. or allied forces. For many years, until 1969, the United States produced and stockpiled chemical munitions as a deterrent to possible chemical attack by an adversary. Warfare with lethal chemicals did not take place on any significant scale in World War II, and has not taken place since World War I except in instances when the attacker possessed chemical weapons and the other force did not.

In 1969 the United States unilaterally ceased further manufacture of chemical weapons. Since that time the accumulated U.S. stock of chemical weapons has been maintained at storage sites in the United States and Europe. More than half of that stock consists of bulk mustard and nerve agent. Of the portion that has been manufactured into munitions, most is in artillery shells, rockets, and some bombs, and most of the munitions containing nerve agent appear still to be usable. However, only a small fraction of the total stock of chemical agent is in a munition form that has the characteristics suitable for employment on a modern battlefield.

During the years since the United States ceased producing chemical weapons in 1969, the Soviet Union has pressed forward a major program to augment its capability to wage chemical war. The Soviets have at least sixteen types of chemical munitions, containing nerve agents and other chemical agents as well. The Soviets also have a large, specially trained and equipped body of troops organized to assist units

fighting in a chemically contaminated environment. There is substantial reason to believe that the Soviets are actively developing new chemical agents, toxins, and bacteriological agents as well, and have employed and experimented with some of these in Afghanistan. The Soviet stock of militarily effective chemical munitions, by the most conservative informed estimates, is several times larger than that of the United States.

The Administration has proposed addition of three chemical weapons to the U.S. arsenal. Each of these would produce nerve agents identical to those that are in existing U.S. chemical munitions. However, these proposed weapons all are of "binary" design, that is, they contain separate compartments of nonlethal chemicals which do not mix and react until after launching to form the nerve agent. Two of the three munitions proposed are ready for production. These are a 155 mm howitzer shell, and the 595-pound Bigeye aerial bomb. Also proposed is a battlefield rocket which still is under development, with range beyond that of front-line artillery.

The advantage of binary chemical munitions over existing unitary ones, which are filled with highly lethal agent, is much greater safety in transportation and handling. In addition, the proposed bomb would deliver a long-lasting agent, capable of retaliating against rear-area military targets, a capability which existing U.S. chemical weapons lack.

After reviewing the nature and condition of the current U.S. chemical stockpile, available information on the Soviet threat, the views of U.S. allies, and the current modernization proposals, the Commission arrived at the following responses to the four questions posed by the Congress in the legislation that established this Commission:

First, the Commission was asked to consider the possible relationship of modernizing the U.S. chemical stockpile to the current effort to negotiate a verifiable multilateral treaty barring chemical weapons. The Commission has concluded that modernization with binary munitions is more likely if anything to encourage those difficult negotiations than to impede them. In fact, if the United States continues to abstain unilaterally from production, the Soviet Union will have little incentive to negotiate, because it will enjoy all the benefits of a freeze

without having to restrain its own production of chemical weapons.

Second, the Commission was asked to consider whether the existing U.S. stockpile of unitary chemical weapons provides an adequate deterrent to Soviet chemical attack.

The Commission believes that deterrence by maintaining a capability to retaliate in kind is a necessary and moral posture to prevent chemical warfare, and that it has a good likelihood of being effective. In particular, the Commission rejects the proposition that escalation to nuclear weapons is a credible or acceptable response to chemical attack.

The Commission has concluded that although the existing U.S. stockpile does provide a deterrent, the stockpile's utility and reliability are declining. Further, the existing munitions are flawed and incomplete in their ability to deter. A large portion of the artillery shells cannot be fired to current maximum ranges, and many are filled with persistent (long-lasting) chemical agent, when current military doctrine calls for use of nonpersistent agent in the front-line area. Even more importantly, there is no usable munition on hand for use against rear-area military targets that contains the persistent type of agent necessary for that mission. That is the most serious shortcoming in the U.S. retaliatory capability.

Third, the Commission was asked whether the Department of Defense's proposed binary chemical modernization program is adequate to provide a credible deterrent. The Commission's conclusion is that the modernization proposed is an essential first step, but that more effort is required, particularly to develop unmanned delivery systems for use against rear-area targets, and to conduct research on defenses against new Soviet chemical weapons.

Fourth, the Commission was asked whether defensive measures alone are an effective response to the Soviet chemical threat. The Commission's firm conclusion is that they are not. Protective clothing is at best a temporary defense against chemical attack, it is untried in actual battlefield conditions, and it cannot be depended upon to save the lives of all military personnel who are in jeopardy. Moreover, it is not available to civilians who are within range of chemical agents.

Protective garments even if effective are extremely uncom-

fortable and oppressive, and interfere seriously with the functioning of military units. Even if chemical weapons are used only against limited areas, if an attacker can force a defender to put on protective gear from expectation of such use, the military effectiveness of the encumbered personnel is cut by 50% or more. If the attacker, who knows the actual location of chemical attacks, is able to fight unencumbered against such personnel, he has a military advantage that is likely to be insuperable. Defensive measures, the Commission concluded, are necessary to try to save lives, and have improved as a result of large investments in recent years, but standing alone they cannot deter chemical attack.

In addition, the Commission recommends an accelerated program to destroy in an environmentally safe way the existing stockpile of obsolete chemical weapons, particularly a few obsolete types which have been found prone to leakage or are otherwise believed dangerous. The Commission also recommends an expanded research and development effort on both chemical weapons and defensive measures, and greater research into defenses against toxins and biological agents that the Soviets are developing. In that connection, more complete intelligence on Soviet activities is essential.

REPORT OF THE CHEMICAL WARFARE REVIEW COMMISSION

INTRODUCTION

Warfare employing lethal toxic chemicals is a subject abhorrent even to contemplate. This Commission, however, was established by the Congress and appointed by the President to do just that: to examine the threat of chemical warfare, and to recommend the most prudent course for this country to adopt in order to counteract it and prevent such barbarism from occurring.

Every member of the Commission subscribes without reservation to that objective: that chemical warfare should not happen. Nor did any of the dozens of witnesses who testified disagree. The sole question is one of means. The need which the Commission has addressed is to determine what U.S. policies and actions will best prevent chemical warfare, while minimizing the risk of nuclear war and maintaining the overall defense posture of this country and our allies throughout the world.

Since the end of World War II, the United States has followed a policy of nuclear deterrence. During that same period

of forty years, there has been no war among the great powers. The Commission believes that the policy of deterrence has been sound, successful and moral. It should continue to be United States policy to take the actions necessary to prevent nuclear or conventional war among great powers, while at the same time not yielding this country's vital interests.

Chemical weapons are an anomaly. They do not easily fit the common distinction between conventional and nuclear armaments. Chemical weapons are capable of causing mass and indiscriminate loss of human life. Militarily, if their use is not inhibited, they could swing the balance in a conventional war; or, alternatively, they could trigger the escalation of such warfare to a nuclear exchange. How to eliminate a temptation by an adversary to use chemical weapons, and at the same time to prevent them from either forcing surrender or precipitating nuclear war, is the central question this report addresses.

The Congress in 1984 directed this Commission to consider four specific points:

> "(1) the *relationship of chemical stockpile modernization* by the United States with the ultimate goal of the United States of achieving a multilateral, comprehensive, and verifiable *ban on chemical weapons;*
> "(2) the *adequacy of the existing United States* stockpile of unitary chemical weapons in providing a credible deterrent to use by the Soviet Union of chemical weapons against United States and allied forces;
> "(3) whether the *binary chemical modernization program* proposed by the Department of Defense is adequate to support United States national security policy by posing a credible deterrent to chemical warfare; and
> "(4) the ability of *defensive measures* alone to meet the Soviet chemical warfare threat and the adequacy of funding for current and projected defensive measure programs." (Emphasis supplied.)

In the balance of this Report, after first reviewing briefly the characteristics and history of chemical weapons, we address each of those questions.

In its deliberations the Commission has become convinced of the gravity of the chemical warfare issue, and the wisdom of the Congress in bringing it to the forefront. For too many years, the very repulsiveness and seeming intractability of the

chemical threat have tempted citizens, political leaders, and even military officers to ignore its existence and put it out of their minds. Such false comfort, the Commission believes, becomes more dangerous with each passing year. To persist in it would be irresponsible.

On the other hand, the Commission has concluded that, once faced, the chemical threat is well within this country's power to deal with. How best to do that, on analysis, is not mysterious at all, probably less so than most issues of military preparedness or public policy. The emotion generated by such an alien and indiscriminate form of warfare is understandable; but only by stripping away the emotion and looking at the facts can the best course of action be found. That is what the Commission has tried to do, and we hope that our effort will assist the Congress and the country in doing the same.

PART I
CHEMICAL WEAPONS POSTURE IN 1985

1. CHARACTERISTICS OF CHEMICAL WARFARE AGENTS

Unlike "conventional" weapons, which cause casualties by piercing or tearing apart the body, chemical weapons deliver agents that react with human tissue, chemically changing it in a way that injures or kills. Like the radiation (as opposed to heat and blast) effect of nuclear weapons, they attack the physiology, rather than the external anatomy, of the body. Because they have no blast or heat, most chemical weapons damage only living organisms, leaving structures and terrain unaffected.

Chemical agents that have been developed for weapons are commonly classified according to

—the way in which they can be dispersed;

—the way they attack the body;

—the length of time they remain able to attack the body.

Dispersal Mode.—Most chemicals usable for war are not

gases, although "poison gas" is a term colloquially used to refer to them. The first lethal chemical used in combat, in 1915, was the gas chlorine, and "gas" became the common term. Most agents in chemical munitions, however, are liquids, which are dispersed either as droplets or vapors.

Types of Agents.—The chemical agents used in World War I were chlorine-based compounds, such as chlorine gas and phosgene, with the more toxic and dangerous mustard gas developed later in the war. The three significant types of known modern agents and their military letter designations are:

—*Blister agents* (mustard, H; Lewisite, L), which burn any body surface with which they come in contact and can kill through secondary effects of blistering in the respiratory system.

—*Blood agents* (hydrogen cyanide, AC; cyanogen chloride, CK), which enter the body by the respiratory system and attack the blood cells, interfering with their ability to carry oxygen.

—*Nerve agents*, which include the "G" agents Tabun (GA), Sarin (GB), and Soman (GD), and also the "V" agents, principally VX. These are organophosphorus compounds chemically related to modern pesticides. The G agents, developed in the 1930's and 1940's, attack primarily through the respiratory system; the V agents, developed in the early 1950's, act by absorption through the skin. G agents can also attack through the skin if they have been mixed with a thickener that slows evaporation, keeping them in liquid form. All nerve agents injure and kill by binding to (and thus inhibiting the action of) acetylcholinesterase, an enzyme of the human body that is essential for the functioning of the nervous system; they produce a range of neurological disorders followed by paralysis, heart or respiratory failure, and death. Nerve agents are extremely toxic and usually kill very quickly—a drop the size of a pinhead can cause death within two to thirty minutes. Nerve agents are invisible, tasteless, and odorless. They cannot be detected without special equipment or until symptoms of exposure appear.

Chemical agents are distinguished from biological agents, which are living organisms, and from toxins, which are nonliving chemical substances that are produced by living organ-

isms (and now can be made through genetic engineering techniques).

Duration of Agent Potency.—Chemical agents also are classified by the length of time they retain lethality on the battlefield. The simplest rule of thumb is that a nonpersistent agent is effective for a matter of minutes after it is dispersed; a semipersistent agent for hours; and a persistent one for days.

For military employment, characteristics of persistence are of crucial importance. A persistent agent can slow an advancing enemy or hamper operations at a supply depot for days, but it usually makes no sense to deliver such a chemical in a way that will contaminate terrain that one's own forces plan to occupy. A nonpersistent agent, on the other hand, can be used effectively to force enemy troops to don protective gear; with proper timing and distance, the chemicals will have disappeared before friendly troops advance into the area.

The principal agents used in modern chemical weapons are:

—*Nonpersistent*: blood agents; G-class nerve agents. (GB usually remains effective for about twenty minutes.)

—*Semipersistent*: thickened G-class nerve agents.

—*Persistent*: Mustard (H) and Lewisite (L) blister agents; V-class nerve agents.

Delivery Modes.—Chemical agents can be delivered to targets by any usual munition—bombs, artillery and mortar shells, mines, rockets, and missiles—and, in addition, by spray tanks. The U.S. Department of Defense has proposed so-called *binary* munitions for its future chemical stockpile. Binary munitions use similar projectiles or containers to deliver the same chemical agents as ordinary (unitary) munitions. However, in binary munitions relatively harmless components that can react to form lethal chemicals are kept separate and not mixed until the weapon is used; the chemical reaction that forms the lethal agent takes place after the munition is fired or launched.

Protection Against Chemical Agents.—Because chemical agents attack by reacting chemically with the body, it is possible, if they can be kept away from the body, to provide protection against them. If a barrier that the agent cannot cross can be placed around the parts of the body that are vulnerable to the agent, the individual can remain unharmed. For some agents, this means a barrier around the respiratory system;

for most modern agents it means one around the entire body. In terms of protection required:

—Mask protection sufficient: blood agent (hydrogen cyanide), G-class nerve agents.

—Whole-body protection necessary: blister agents (mustard and Lewisite), V-class nerve aqents; thickened G-class nerve agents. The urgency of covering is greatest for nerve agents. The mask alone will protect against death from mustard agent; the burns are painful and temporarily disabling, but seldom fatal. Nerve agent absorbed through the skin, however, can result in death within a few minutes.

The United States, the Soviet Union, and U.S. European allies have developed individual protective gear well beyond the still-standard gas mask with an activated charcoal filter. In varying degrees they also have developed protective shelters, combat vehicles sealed against chemical agents, and procedures for decontaminating vehicles and equipment. The United States, after a late start, has developed individual protective clothing that is relatively more comfortable—because some air and moisture can penetrate it—than the Soviet garments, which are of impermeable rubber and therefore designed to be worn for only two hours at a temperature of 59° F., and probably for only half an hour or less at higher temperatures. However, the Soviet Union is far more advanced in providing chemical-proof combat vehicles along with the tactics and doctrine to use them, plus a sizable force structure and extensive, realistic training in detection, decontamination and protection.

Although protection against chemical agents can be provided to some degree, to do so is not easy. And even if the protection works, it is enormously burdensome. It does not negate the military utility of chemicals or erase the advantage held by the side that initiates a chemical attack, especially if the targets are sufficiently distant or the effect sufficiently transitory that the attackers themselves need not wear protective clothing. (And, of course, it does not protect civilians—who, if soldiers are protected, become the major chemical casualties in a chemical attack.) Infantry, computer operators, tank crews, aircraft ground crews, and pilots who must try to work in protective garments are far less effective than normal.

Also, rapid detection of modern odorless and highly lethal agents is a particularly difficult aspect of defense. A central fact of modern chemical warfare is that defense to an increasingly uncertain degree is possible; but even effective defense is, at best, an enormous burden and military disadvantage.

Military Employment of Chemical Weapons.—Chemical weapons used across a wide front tend to slow an attacking force, because of the need for cumbersome protective clothing. Targeting chemical attacks on specific and non-contiguous vulnerable points is more consistent with an offensive strategy.

Intelligence analysis suggests that Soviet doctrine calls for employment of chemical weapons against key defense points, such as rear-area airbases, command centers, port facilities, equipment storage areas, logistical choke points, and U.S. nuclear systems and communications. Chemicals can also be used selectively to create weak spots in the line of defense. Military leaders emphasize that merely being able to force an enemy into defensive clothing because of expectation of a chemical attack, and thus to impede the functioning of encumbered personnel, creates an enormous military advantage, one that can extend up and down the front, far beyond the location of any actual use.

2. CHEMICAL WARFARE IN THE TWENTIETH CENTURY

Although there are stories from antiquity and early modern history of noxious fumes being dispersed in battle, real chemical warfare begins with the First World War.

Chemicals in World War I

In the first months of the war the French army released tear gas, a riot-control agent already used by police, and the Germans fired tear gas in artillery shells beginning in January 1915. The first use of lethal gas came in the ninth month of the war on April 22, 1915, near Ypres, Belgium. In a carefully prepared attack, German soldiers opened the valves on more than 5,000 cylinders of chlorine, sending a miles-long cloud of gas toward the French trenches. Two French divisions, one an elite unit, panicked and fled, opening a five-mile gap in the Allied lines. However, the German commanders, who had been skeptical of the new weapon, had not assembled enough reserves to exploit the breakthrough. During the night the Allies pushed up reinforcements to close the gap, and never again did gas have such dramatic tactical success.

Within a few days Allied troops were using makeshift protective respirators—squares of women's hat veiling stuffed with cotton waste and impregnated with photographer's "hypo" solution, or hankerchiefs wet with urine, tied over the nose and mouth. There were more instances of panic during gas attacks, but none on a large scale, and on several occasions troops moved forward through gas clouds to reinforce the front lines.

Within a few months the Allies had their own lethal gas, and by the end of 1916 all the warring powers had chemical weapons, as well as gas masks to provide reasonably effective protection against them. The protection, however, did not mean that chemicals thereafter were considered useless. Poison gas attacks steadily increased throughout the war. In fact, most of the World War I chemical munitions were expended in the last year, 1918. Chemicals seem to have been regarded by troops and commanders as little different in moral terms from other weapons. In the postwar period, however, they came to symbolize the horrors of modern war and were looked upon with disdain by many military officers as well as civilians.

Throughout World War I there was a constant effort to develop new agents and new tactics that would overcome the enemy's countermeasures. An estimated 38 to 50 chemical agents were tried during the war, the most effective of which was mustard gas, which the Germans developed methods to produce in quantity and began using in 1917. Although its persistence made it useless for pre-attack preparation fires, it was a formidable delayer of enemy advances. The Germans also used mustard agent to neutralize artillery batteries and supply operations, and for preventing defending Allied troops from bringing up reserves. Because it penetrated boots and uniforms to cause painful burns, gas masks alone could not fully protect against it.

Gas tactics stressed surprise, to catch enemy troops without masks. Efforts were also made to induce unmasking. Sometimes, for example, a relatively nonlethal agent that could penetrate the mask and cause coughing or vomiting would be used to force unmasking at the same time that a lethal agent was fired. Delivery means, besides the original pressure cylinders, included artillery shells, mortars, and "projectors" that lobbed canisters of agent into enemy trenches.

In all, World War I saw approximately 1.3 million gas casualties, of which about 92,000 (7%) were fatal. Even though Russia stopped fighting in 1917, a disproportionate number of the war's gas casualties (35%) were Russian troops on the Eastern front, who were not consistently equipped with gas masks nor drilled in good gas discipline. Italian troops also

suffered disproportionately, possibly for the same reasons. The Russians also lacked a significant chemical retaliatory capability. For all armies,

—Chemical agents were a small proportion (perhaps 5%) of total ammunition fired, though increasing as the war went on;

—Gas casualties were a small proportion (8% for the British) of all casualties;

—Gas deaths were a very small proportion of gas casualties.

Chemical weapons in World War I were not a decisive weapon, but were effective for a number of specific military purposes, and were used more and more as the war lengthened, even though during its last months the war became more mobile. By the end the Germans, according to one source, were using high-explosive shell and chemical shell in a ratio of 50:50.

The Washington Treaty of 1922 outlawed the use in war (except in retaliation) of lethal poisonous gases and similar substances. It was ratified by the United States but never went into force because France, one of the five signatory powers, failed to ratify it. Three years later, the Geneva Protocol, containing language identical to that of the Washington Treaty, and drafted by the U.S. delegation, was signed by the United States and 28 other countries, including the Soviet Union. However, it was not ratified by the U.S. Senate. The United States continued to abide by the 1925 Geneva Protocol, and finally ratified it in 1975.

Nonuse in World War II

When World War II began in 1939, most of the belligerents were opposed to the use of chemical weapons and were not fully prepared to use them. Great Britain, for example, did not begin to acquire a retalitatory capability until less than a year before the war started. Italy had used mustard gas against Ethiopian troops in 1935 and 1936, in violation of the Geneva Protocol and to the outrage of leaders and publics in most countries. But although the warring powers had only small amounts of chemical munitions at the beginning of the war, these increased so sharply that by 1945 the total stockpile far exceeded the total chemical munitions used in World War I.

Qualitatively the agents were more deadly also, because nerve agents had been discovered and developed, first in Germany and then elsewhere, in the 1930's. Germany made the first nerve agent (GA) in 1936, built the first pilot plant in 1939, and had manufactured 12,000 tons by 1945.

Beginning in the 1930's and continuing as late as 1944, Japan, which was much better armed chemically than China and did not fear retaliation, used some chemical agents against Chinese armies and civilians. However, it never used chemicals against the United States, and none of the other belligerent powers used chemicals militarily during the war. During the first years, 1939–43, the powers appear to have been largely self-deterred—by their commitment to a no-first-use policy, or by the judgment that chemical use would not be tactically advantageous. For example, the Germans had no need to use chemicals in their early campaigns in Poland, France, and the Low Countries, because speed was essential to their strategy, and chemicals would slow them down. The Allies apparently did not consider using chemicals to try to halt the German *Blitzkrieg*. The British were prepared to use their limited supply of mustard gas against German invaders in 1940, but the invasion never came.

During 1943–45, fear of strategic chemical retaliation seems to have deterred use of chemicals at several points where combatants were tempted to use them. The British and German leaders saw their cities as hostages to chemical attack. In May 1942, Prime Minister Churchill had committed Britain to retaliation against German cities if Germany used chemicals against the Soviet Union. The following month, President Franklin D. Roosevelt (who in 1920 had served on an advisory committee to the Washington Disarmament Conference that led to the 1922 treaty, and personally loathed chemical warfare) threatened retaliation against Japan if it did not cease using toxic weapons against the Chinese. In 1943 he warned that the United States would reply to enemy use of chemicals with "full and swift retaliation in kind." By that time the Allies were gaining overwhelming air superiority. The British, at the same time, despite air superiority, were restrained by the German buzz-bombs and V-2 rockets, which they knew could be armed with chemicals.

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Probably the Allied invasion of Normandy brought chemical use closest. General Omar Bradley wrote after the war that "even a light sprinkling of persistent gas" on Omaha Beach could have cost the invaders the beachhead. The Germans seriously considered using chemicals; they had sizable stocks and ample means of delivery (artillery and rocket), and they also recognized the great advantages of a chemical defense. German sources make it reasonably clear that it was the fear of chemical retaliation, particularly in the context of Allied air supremacy, that prevented chemical use.

In the last months of the war in the Pacific, there was little militarily to deter U.S. use of chemicals against the Japanese, and there loomed the prospect of an estimated 1,000,000 Allied casualties—nearly all Americans—from an invasion of the Japanese home islands. Army Chief of Staff General George C. Marshall was persuaded that gas would be useful in mopping-up operations that otherwise would take great numbers of American lives. Admiral William D. Leahy, however, Roosevelt's senior military advisor and *de facto* Chairman of the Joint Chiefs of Staff, resisted, citing President Roosevelt's unequivocal renunciation of first use. With the dropping of atomic bombs on Hiroshima and Nagasaki, the war against Japan ended without the issue of chemicals being revisited.

Since World War II

There have been several instances of use of lethal chemical agents in war in the past twenty-five years. The frequency appears to have been increasing, and during the past five years the world has seen the first instance of lethal chemical use in war by a major power—the Soviet Union—since World War I. Lethal chemical weapons have been used:

—By the Egyptians in Yemen, 1963–67.

—By the Vietnamese in Laos and Cambodia in the late 1970's, including biological toxins, perhaps supplied by the Soviet Union.

—By the Soviet Union in Afghanistan, beginning in the early 1980's. Intelligence information made available to the Commission supports the conclusion that not only well-known lethal chemical agents, but also new, experi-

mental agents, and also biological toxins, have been used by the Soviets in Afghanistan repeatedly and systematically.

—In the Iran-Iraq war, by Iraq, continuing to the present date. A United Nations investigating panel of scientists from neutral countries reported that mustard agent clearly has been used. Recent reports are that in addition Iraq may now be using nerve gas and perhaps also new lethal substances.

3. UNITED STATES POLICY ON CHEMICAL WEAPONS

The United States like the other belligerent powers used chemical weapons in World War I. Although the Senate did not ratify until fifty years later the 1925 Geneva Protocol that prohibited use of both chemical and biological weapons in warfare, nevertheless, "no first use" of toxic chemical weapons was declared by President Franklin D. Roosevelt to be the U.S. policy in World War II and has remained so to this day. During and after World War II, however, the United States acquired and stored a considerable stockpile of chemical warfare agents, mostly mustard and nerve agents, some in munitions and some in bulk form. In 1954 binary chemical weapons were first proposed by U.S. Army scientists, and a research and development program began soon afterwards.

In 1968 it was widely reported that a number of sheep had died near Dugway Proving Ground, Utah, an isolated desert range where the United States conducted live-fire tests of chemical weapons. (Whether chemical munitions had been the cause was never established.) In response, the Congress in 1969 enacted a statute that bans open-air testing of chemical weapons (as well as their transport or disposal) unless the Secretary of Defense determines that such testing is necessary in the interests of national security, consults for safety advice with the Secretary of Health and Human Services (and the President, if they cannot agree), and notifies the Congress. No such determination by a Secretary of Defense ever has been issued, and no open-air testing has taken place since 1969. There have been tests of delivery vehicles filled with non-lethal agents, and tests using toxic materials conducted in sealed chambers in laboratories.

In 1969 President Richard Nixon reaffirmed renunciation of the first use of lethal chemical weapons, extended that policy to include non-lethal incapacitating agents, and unconditionally renounced all methods of biological warfare. He also announced that he would resubmit the 1925 Geneva Protocol to the Senate for ratification, and did so the following year. In 1970 he also extended the renunciation to include toxins, which are chemical products of biological organisms. Production of U.S. chemical weapons had in fact stopped in 1969, because the military's full requirements at that time had been purchased, and the Department of Defense was preparing to move soon into binary weapons as a replacement for the older unitary weapons in the stockpile.

President Nixon's announcement ended further production plans, and all facilities producing chemical weapons were closed. Research on and development of chemical weapons were sharply cut back, but continued slowly. The 155 mm binary artillery munition completed all pre-production testing in 1976, and the factory to build it was completed in 1985. Development of the Bigeye bomb was halted from 1969 to 1976; after some initial deficiencies that since have been corrected, is now ready for operational testing and production, but no full-scale production facility yet exists.

In 1975 the U.S. Senate finally ratified the 1925 Geneva Protocol on chemical and bacteriological warfare, with a reservation, like that of most signatories, that the Protocol shall not apply to retaliation if chemical weapons are used first by an enemy. Simultaneously in 1975, the United States (and soon afterwards the Soviet Union) ratified the 1972 Convention on Bacteriological (Biological) and Toxin Weapons, in which the signatories agreed to destroy all biological weapons and not to conduct research to develop such weapons. Although the Convention calls for parties to cooperate with investigations of alleged violations, the Soviet Union has refused to do so. The Convention has no verification provisions.

Also in 1975, following criticism of U.S. use of herbicides to clear jungle, and on a few occasions prior to 1969 of nonlethal tear gas, in Vietnam, President Gerald R. Ford issued an executive order still in effect which renounces first use of such non-lethal chemicals in warfare.

In 1980, then Secretary of Defense Harold Brown asked for a thorough review of U.S. chemical warfare posture by the Defense Science Board, explaining:

> "Recent events have focused attention on the Soviets' capability to wage chemical war and to defend themselves in a chemical environment. The Soviet forces appear to be prepared to fight in a CW environment, and show willingness to do so if it is advantageous to them.
>
> "My recent Consolidated Guidance (1) reflects the intent to modernize our chemical defenses to deny the Soviets a major military advantage from the use of CW weapons, and (2) requires that the Army plan to proceed with a binary agent production facility at the earliest opportunity to improve air-delivered and artillery munitions. However, these actions may not be enough."

The report of that review in 1981 concluded that modernization of U.S. chemical weapons was necessary. Beginning in 1981, the Congress appropriated funds for construction of the binary agent production facility, but did not appropriate funds for actual production. Since that time the effort to develop protective measures against chemical weapons also has increased sharply.

In 1984, Vice President George Bush announced at the Conference on Disarmament in Geneva that the U.S. Government's policy is to seek a verifiable mutual ban on chemical weapons of every kind, and verifiable destruction of existing stockpiles; he offered a draft treaty seeking to implement those objectives.

Today the United States policy regarding chemical weapons includes these elements:

1. No first use of chemical weapons.
2. Efforts to negotiate a verifiable ban on production and stockpiling of chemical weapons.
3. Maintaining protective measures for defense against chemical attack.
4. Deterrence, by threat of retaliation, of chemical attack by an adversary.

Chemical weapons are the only weapons as to which the United States has pledged no first use.

4. NATURE AND CONDITION OF THE U.S. STOCKPILE

Today the United States has chemical munitions stored at eight sites in the continental United States, one site in Europe, and on Johnston Island, a 660-acre U.S. possession 825 miles west of Hawaii in the Pacific Ocean. By weight, most of the total is in the continental United States, some in Europe, and a relatively small amount on Johnston Island. The munitions on Johnston Island were shipped from Okinawa in 1971. Members of the Commission have inspected most of the sites.

The U.S. store of chemical munitions is an accumulation mainly of artillery shells and relatively few bombs, manufactured in the 1950's and 1960's, along with one-ton drums of bulk chemical agent that date back as early as the 1940's. Because of the danger of an accident in handling or a hit by enemy gunfire in time of war, U.S. Navy policy prohibits placing unitary chemical weapons on ships, and U.S. Air Force policy prohibits storage at air bases. All chemical weapons and bulk agent are stored by the Army, in standard earth-covered ammunition igloos (except on Johnston Island), and in metal sheds for spray tanks and bulk nerve agent. All the storage areas are double-fenced and specially guarded.

The Department of Defense calculates that only 28% of the total tonnage of chemical agent on hand could be put to any military use at all. And only 7% of the agent that has already been manufactured into munitions substantially meets current Department of Defense requirements.

The Commission has reviewed those calculations and believes that they are unduly pessimistic. One can assume, for instance, that in an emergency requiring retaliation or in an-

ticipation of such an emergency, the armed forces could use a greater proportion of the weaponized munitions, that would include those that are not optimized for current tactics. Also, means could be found to convert to usable military form a portion of the bulk agents in storage today, at substantial cost but probably in substantially less than the two years that the Department of Defense estimates today. Moreover, most of the 8-inch and 155 mm artillery shells have been checked, repaired, equipped with bursters and painted in the past five years; notwithstanding concerns about safety in transport and handling, they appear to be serviceable. However, because of age, uncertain toxicity, and design unsuitability for any contemporary combat use, much of the current chemical weapons stockpile is not an asset, but rather is a liability, for the United States.

At the same time, the Commission has found that rumors of the stored munitions being dangerous or leaking appear to be exaggerated and inaccurate. The number of artillery rounds in which leakage has been found is infinitesimal, amounting to 6 per 10,000 artillery rounds. Panels of scientists from the National Research Council that conducted tests in 1983 concluded that the metal parts of most kinds of artillery rounds and bombs were sound. All the weapons in Europe are serviceable. Only two types of munitions, the obsolete M-55 battlefield rocket and some bombs filled with a nonlethal incapacitant, present an immediate safety problem. From a safety point of view, under existing procedures the rest of the chemical weapons on hand, except for an occasional rare faulty round, can be stored indefinitely, barring cataclysmic natural events like earthquakes, or interference by hostile outside forces such as terrorists.

There is more doubt about suitability from the standpoint of efficacy. Nerve agents are widely believed to lose their potency after about 25 years. The 1983 tests, however, found only a small diminution in potency, some of which may reflect original manufacturing impurities. The Army has been conducting tests of samples to simulate the effects of aging by raising their temperature; data from these tests are not yet available. A widely held scientific consensus is that the agents will lose effectiveness by sometime in the 1990's, but precisely when

and at what rate remain in dispute. There also is uncertainty whether aging may cause chemicals to "flash," *i.e.*, burn rapidly instead of disperse when fired from an artillery shell.

The Commission was unable to discover empirical data that show significant loss of potency of the existing nerve agent, either bulk or in munitions. Mustard agent on hand remains still chemically potent, but may have physically hardened.

The chemical munitions that the United States has in storage consist of:

1. *155 mm howitzer rounds.* These are usable today, and the 155 mm howitzer is standard in NATO and is the most common artillery piece in the U.S. Army. However, because of their 1950's shell-casing design, these rounds cannot safely be fired at ranges greater than about 17 kilometers, in contrast to the approximately 5 to 7 additional kilometers of which modern conventional artillery rounds are capable; thus their military utility, to that extent, is less than what new chemical rounds would have. According to current U.S. infantry tactics, the only military use for chemical agents within artillery range of the front lines would be for nonpersistent agents. Yet a large portion of the stock is filled with mustard agent, which was used in World War I and is highly persistent (and also of limited use because it turns solid at temperatures below 58°F). Of the remaining shells, which contain nerve agent, a substantial number are filled with nonpersistent GB, but most contain persistent VX.

2. *Eight-inch howitzer rounds.* These also remain in usable condition and are compatible with NATO artillery, but with similar range limitations. Their age is similar to the 155 mm rounds. Most are filled with nonpersistent GB, the rest with VX.

3. *105 mm howitzer rounds.* These are stored in large quantity and are presumed usable. One-third of them are filled with mustard agent; the rest contain nonpersistent agent (GB) that is suitable for short-range retaliation (up to 11 kilometers). However, neither the U.S. Army nor our NATO allies any longer deploy 105 mm artillery in Europe. There are 828 105 mm howitzers elsewhere in the U.S. Army today, and they remain standard in the U.S. Marine Corps as well as in the

South Korean armed forces. The 105 mm howitzer will also be part of the five light divisions that the Army is forming.

4. *4.2-inch mortar rounds.* All are filled with mustard agent, with a maximum range of only 4.5 kilometers. The U.S. Army is phasing out 4.2-inch mortars, and will have none in service after 1990. Moreover, current doctrine would see no military use for persistent mustard gas at such close range.

5. *155 mm gun rounds.* These have no use because neither the United States nor any other NATO country is armed with 155 mm guns.

6. *M-23 land mines.* Produced in the 1950's in contemplation of defense against human-wave infantry attacks in the Far East, these are incompatible with modern maneuver warfare. All the mines are filled with persistent VX. Because once laid they cannot be controlled, their employment would also be inconsistent with the United States' policy of no first use of chemical weapons. Several instances have been found of mines leaking, but none of the leaks has penetrated the outer metal containers in which the mines are packed.

7. *M-55 115 mm battlefield rockets.* These are obsolete weapons for which no launcher exists. They are filled with GB or VX. Because their casings are aluminum (instead of the steel used in other chemical munitions), and their nerve-agent contents react with aluminum to release methane gas and cause a buildup of pressure, they are the only stored munitions that have developed a leakage problem of troublesome dimensions. Each rocket is stored in an individual fiberglass and metal container, and nearly all instances of vapor escape have involved GB and have been confined within the sealed packing cylinder, detected only by sampling the air inside. Also unlike other munitions, the rockets have built-in fuzes and rocket propellant that increase the danger of accidental detonation, although this has not occurred. The rockets are the only portion of the chemical stockpile that the Army has declared to be hazardous waste.

As for aircraft-delivered munitions, the storage areas now contain the following, all in rather limited quantities:

8. *MC-1 750-pound Air Force bombs.*

9. *MK-94 500-pound Navy bombs.*

10. *MK-116 ("Weteye") 600-pound Navy bombs*, designed

to release an aerosol spray on detonation.

11. *M-43 BZ 750-pound cluster bombs* and *M-44 175-pound air-dropped BZ cluster generators.*

12. *TMU-28 airborne spray tanks.*

Bombs would be used principally against airfields and concentrations a hundred miles or more behind the front lines, targets for which a persistent agent is necessary to provide lasting interference. Yet all the bombs in the inventory except the cluster munitions are filled with nonpersistent GB, which becomes ineffective within a few minutes. They also lose up to 60% of their chemical payload from soil absorption and burning when they hit the ground. The cluster bombs and cluster generator contain a non-lethal hallucinogenic agent called BZ, which was developed in the 1950's but was later decided to be too unpredictable for military use.

The TMU-28 spray tanks are the only aircraft-delivered items in the stockpile that contain persistent nerve agent. (1356 pounds of VX). They were produced two decades ago and can be used only by flying the aircraft on a slow, steady, straight course over the target (300 knots or less and below 500 feet) while it releases the chemicals. Against modern air defenses, such tactics would be ineffective and suicidal. Furthermore, spray tanks once opened contaminate the aircraft carrying them. Today spray tanks cannot be fitted on any U.S. attack aircraft more modern than the F-4, which is being phased out by the U.S. Air Force. Shipping a spray tank requires an enormous steel container that weighs three tons loaded.

The BZ weapons are considered a hazard because they are filled with a solid pyrotechnic mixture, which becomes less stable with the passage of time. One weapons bunker that contained these munitions at Pine Bluff, Arkansas, burned in a lightning storm in 1971. The Commission found no significant storage safety problems with any of the other air-delivered ordnance. The difficulty is that militarily it is essentially useless.

In addition, the United States has a large quantity of bulk chemical agent—some 61% of the total chemical inventory. This bulk agent includes the nerve agents GB and VX, mustard agent, and some BZ incapacitant. Most of the bulk agent

is stored in liquid form in one-ton steel cylinders, lined up in open-air fenced areas for mustard agent, and in enclosed build-ups for nerve agent. The oldest was produced in the 1940's, the newest in 1968. No instances of leakage from these containers have been reported. The Commission was told that if funds were authorized for that purpose, two years would be required to set up filling equipment to transform that bulk agent into munitions, mainly because of the need to upgrade 1960's facilities to conform to exacting current environmental and occupational health standards. Two years nevertheless appears excessive. Time would be required also to manufacture the necessary shell casings.

In summary, in terms of safety, with the exception of the M-55 rockets and the BZ munitions, the inventory of U.S. chemical munitions, though inherently dangerous, is not actively hazardous today under normal storage conditions. But in terms of realistic military missions, the only usable portion consists of artillery shells at least sixteen years old, of which only a portion are filled with the nonpersistent chemicals suitable for artillery use according to current doctrine. For chemical retaliation missions that would call for a longer-range system, the question is not whether to modernize. Rather, it is whether to acquire a secure but effective chemical weapons capability.

5. THE CURRENT CHEMICAL WARFARE THREAT

Soviet Chemical Warfare Capability in Europe

The Soviet Union built industrial plants and produced a large quantity of mustard gas in the 1930's. By that time, however, the Germans were developing nerve gases. After World War II, the Soviets moved captured German chemical munitions facilities, along with the scientists who worked in them, to the Soviet Union, and began producing nerve-agent weapons. However, the Soviet Union apparently did not give chemical programs high priority until the early 1970's—just after the United States abandoned its own chemical weapons production. The new Soviet program included efforts to develop new chemical agents for the 1980's and 1990's.

During the 1950's and 1960's, the United States had been producing unitary chemical munitions and continued the research in chemical weapons that led by the 1960's to the development of binary munitions. Also during the 1960's, Soviet military leaders apparently became concerned about the seeming U.S. technological lead in this and other military areas and recommended stepped-up efforts to develop and produce more chemical weapons. The Soviets also emphasized detection, protective devices and decontamination equipment — needed either for defense, or to facilitate operations in areas contaminated by Soviet chemical attacks.

So far as can be learned, that Soviet chemical-weapons effort has progressed relentlessly ever since, notwithstanding

the unilateral U.S. abandonment of chemical weapons production in 1969.

Whether that continued buildup reflects a Soviet strategy to place even greater weight on chemical forces, or is the product of the steady momentum of the Soviet armaments bureaucracy, the consequences are the same. The United States does not have a comparable capability, the imbalance is worsening, and the Soviets already have the capability for extensive and effective use of chemical weapons.

Today Soviet troops train in the offensive and defensive use of chemical weapons. Unlike U.S. troops, they train with actual toxic agents in small amounts. The Soviets have organized special units for detection and decontamination, both radiological and chemical, equipped with special vehicles. Over 50,000 Soviet ground troops are involved, plus 40,000 other ground troops with chemical missions, as well as additional personnel in the Soviet Air Forces and Strategic Rocket Forces. No comparable units in U.S. or NATO armies exist; the United States military has 9,000 chemical specialists, plus 11,000 in the reserves and national guard. The Soviet "Chemical Defense Academy" at Shikhanyy teaches and develops chemical warfare offensive doctrine as well as defensive. The Soviets conduct regular military exercises simulating chemical warfare. Soviet tanks and armored infantry vehicles, unlike most U.S. counterparts, are pressurized and equipped with filters to protect against gas and nuclear contamination, permitting the crews inside to operate without the encumbrance of bulky and awkward protective clothing. Soviet chemical warfare capability exists in all Soviet military forces, along both the European and Far Eastern borders, and also in the forces forward-deployed in other countries of Eastern Europe. The Soviets maintain that these costly and pervasive activities are purely defensive.

The Soviets have fourteen known chemical weapon production facilities, and may have more. Soviet production rates of chemical weapons are not adequately known. It is clear beyond doubt, however, that the Soviets now deploy chemical warheads on sixteen different modern weapons, including:

Aircraft bombs
Howitzer rounds

Mortar rounds
Land mines
Grenades
Multiple rocket launchers
Free rockets over ground (FROG)
Tactical ballistic missiles

There also is evidence that Soviet cruise missiles may have been provided chemical warheads. The Soviets maintain sufficient stocks of chemical weapons to carry out offensive operations at any level, and there is evidence that they are developing new types of toxic agents to defeat NATO gas masks and protective clothing.

Exact deployments and quantities of Soviet chemical munitions are not precisely known. Intelligence gathering has been hampered by lack of effort and resources devoted to this task, further complicated by the unusually intense efforts of the Soviets to prevent disclosure of their chemical warfare activities. Because Soviet chemical munitions are transported and handled similarly to conventional ones, their presence is not discernible by satellite photography. It is well established, however, that the Soviets have major resources devoted to research, development, testing, production and storage of chemical weapons at a number of sites throughout the Soviet Union. There are indications that such activities also exist in several of the Eastern European countries of the Warsaw Pact, including Poland, Czechoslovakia, East Germany and Romania. By the most conservative informed estimates, the Soviet stockpile of chemical munitions is several times as large as the usable portion of the U.S. inventory. The evidence is more than sufficient to establish a major Soviet program to produce, and in time of war to employ, chemical weapons.

There also is clear evidence of Soviet use of chemical weapons of more than one kind in Afghanistan. This not only confirms the lack of any Soviet scruples in employing chemical warfare. It also is another instance in which a country that is armed with chemical weapons has not hesitated to use them against one that is not. Further, it reflects the Soviet inclusion of chemical attacks in ordinary military tactics, as well as willingness to test new substances on a defenseless population, refining their chemical warfare operational techniques

and doctrine, and improving their readiness to use these weapons elsewhere.

The Commission has been informed by intelligence sources in this country and elsewhere that, since about 1976, Soviet doctrine on employment of chemical weapons has changed. Prior to that time, the Soviets planned to employ chemical weapons in a "massed" fashion, in heavy volume along the front line. It now appears that Soviet military thinking calls for a more limited and selective use, emphasizing surprise, sometimes by commando and raider groups as well as by missiles, against key targets in Western Europe: command centers, port facilities, and the highly vulnerable depot areas where prepositioned U.S. military supplies to equip U.S. divisions arriving in Europe are stored.

That change to a more modern doctrine is not encouraging, however. It represents a Soviet conclusion that its attacking forces would best be served by limiting chemical use to key areas, so that they can fight unencumbered elsewhere. More importantly, it suggests that Soviet chemical attacks are planned to be sufficiently discrete in area and target that Western political authorities, unless they had sufficient chemical retaliatory capability, would be likely to hesitate before turning to nuclear arms as a response. As officials of one European government pointed out to the Commission, the new doctrine makes Soviet use of chemical weapons more, rather than less, likely.

The Commission knows of no reason, other than fear of retaliation, to assume that the Soviets would not use chemical warfare if they judged it to their advantage to do so. A NATO posture that lacks the credible capability to respond in kind, and instead relies on nuclear retaliation, lacks both credibility and logic.

Other Regions

The Commission is concerned that virtually all of the U.S. Defense Department's thinking about the chemical warfare threat appears focused on possible Soviet use in Europe. Yet there are U.S. forces in other areas just as vulnerable, and there are other countries whose security is of concern to the

United States. The possibility exists that North Korea, a country not noted for restraint, would use chemical weapons to attack U.S. and Republic of Korea forces that are stationed in South Korea. United States air and naval forces based in Hawaii, Japan, Diego Garcia, the Philippines and Okinawa could also be vulnerable, as could U.S. naval forces at sea. The threat of chemical attack in the Far East has not received adequate attention, even though Asia is where chemical weapons most recently have been employed. A recognized U.S. ability to deploy effective chemical munitions quickly and safely to the Pacific or Indian Ocean basins could help to deter such use.

6. PROLIFERATION

Chemical weapons are relatively simple to produce, hardly more complex than conventional munitions. They do not involve advanced high technology. They are inexpensive, and the manufacturing processes and necessary ingredients for nerve agents are similar to those for fertilizers or insecticides. At the same time, even relatively small quantities of chemical weapons can be militarily significant.

Chemical weapons already have become available not just to the major powers, but also to third-world countries that have, like the Soviet Union, lacked the scruples to eschew their use. These governments have had support from private companies in some industrialized countries (not including the United States). The best available estimate is that sixteen countries including the United States and the Soviet Union now have chemical weapons, a historical peak.

It has been suggested to the Commission by some witnesses that unilateral renunciation of new chemical weapons by the United States would encourage other countries not to seek them. The Commission could find no evidence from history on which to base such an assumption, and none was offered. On the contrary, several countries allied to the United States have forgone their own offensive chemical weapons because they depend on the U.S. capability.

It has also been argued, on the other side, that the existence of a modernized U.S. chemical retaliatory capability would help deter a third-world state from using chemical weapons against the United States. The Commission doubts that proposition also, because it seems unlikely that the United States, with its other military capabilities and its own repugnance for

such warfare, would take the step of responding with chemical weapons against a chemical threat from a minor power that could be handled by conventional military means. The possibility of such a U.S. response, however, might have some deterrent effect.

The Commission has concluded that modernization of the U.S. chemical capability is not likely to affect proliferation of such weapons significantly. U.S. arms control negotiators share this view, and believe that the decision is not likely to affect the attitudes of third-world countries in multilateral negotiations seeking a treaty to ban chemical weapons.

At the same time, the Commission views proliferation as an extremely serious danger which requires more vigorous action than heretofore. The failure of the United States and allied governments to devise and take strong measures against Iraq and its known suppliers has been an inadequate response. It is reminiscent of the international lethargy in the face of complaints by Ethiopia and China when poison gas was used against them by Italy and Japan, respectively, in the 1930's.

The Commission agrees with the observation of French officials that use of chemical weapons must not be allowed to become "banal." There is danger that this is precisely what is happening today. When such gross violations of human decency occur, strong action is called for, even at the expense of short-term economic or diplomatic interests. For example, eight chemical ingredients are known to have almost no use except for manufacture of chemical weapons, and about thirty more have both legitimate and illegitimate uses. International transportation of such substances should be tightly controlled. For the longer term, arms control and tighter restrictions on transfer of technology and hardware, in cooperation with other advanced countries, appear to offer the most promise.

In addition to proliferation of chemical weapons, terrorism is a threat. Chemical weapons do not lend themselves to such uses in the same way that biological weapons do, but the possibility of terrorist uses of either should be examined and countermeasures planned against both.

7. THE PROPOSED U.S. MODERNIZATION PROGRAM

Proposals to modernize U.S. chemical weapons to make them safer have been presented to the Congress for several years. Although chemical munitions modernization continues to have thoughtful and sincere opponents, it has not been a partisan issue. It has been, however, an issue that political leaders in Europe as well as in the United States have not been eager to deal with. Until recently, it has not been sufficiently emphasized in intelligence collection or war planning, nor has the Department of Defense pressed it as a high enough priority (except for individual defense for combatants) in submissions to the Congress.

PROPOSED MUNITIONS

The Fiscal Year 1986 budget proposal calls for initial production of two binary chemical weapons and continued development of a third. They are as follows:

1. *The BLU-80/B Bigeye 595-pound bomb.* This is an air-dropped munition that produces about 185 pounds of the persistent nerve agent VX, spraying it in heavy droplets through ports in the bomb as it falls. The bomb was conceived in 1959. Exploratory development began by the U.S. Navy in 1961, engineering development in 1965, and testing in 1969. The program ceased in 1969 and resumed in 1976. The bomb produces VX through the reaction of QL (ethyl-2-diisopropylaminethylmethyl) and sulfur. The reaction occurs when an inserted rod of sulfur mixes with the other ingredient as the bomb falls. The mechanical functioning of the bomb has been operationally tested with simulated ingredients, and in a sealed chamber with actual agent.

Problems developed late in the development phase when the bomb had to be adapted from the high-altitude (and therefore low-temperature) release planned in the 1960's to the current low-altitude, higher-temperature delivery necessitated by modern air defenses. As originally conceived, the two nonlethal ingredients would be mixed before the bomb was dropped. Tests in 1982 showed that, at low altitudes, mixing on board the aircraft before release was not feasible because pressure inside the bomb built up too soon. In the 1983 redesign of the bomb, the chemicals mix only after release, so that excessive pressure does not have time to build up. With these changes, the pressure problems, which led to failures of the bomb casing, have been corrected along with a number of other technical design deficiencies, and the bomb has functioned satisfactorily in all recent series of tests. Mechanically the bomb is complex, much more so than a unitary bomb.

The bomb would be delivered from Air Force, Navy or Marine Corps attack aircraft against enemy airfields, rear command and communications centers, railheads and other concentrations. Three bombs can cover approximately one square mile. The anticipated technique of delivery is the common "loft" or "toss bombing" technique which allows the bomb to be released two to four miles from the target, so that the aircraft does not need to fly through the most dense antiaircraft defenses. In the case of the Bigeye, this delivery also provides the several seconds required after release for the chemicals to mix.

There is no basis, the Commission believes, for assuming that the delivery method contemplated is more vulnerable than for conventional ordnance that would be used to attack enemy bases. Flight patterns for delivery on the target would be similar, and because the droplets released are heavy, they are less subject to wind drift. However, as noted later, aerial bombing often is not ideal for strikes at targets far behind the front lines. Bombing in a highly defended environment is dangerous no matter what the ordnance or delivery technique.

The Bigeye is ready for limited production in the autumn of 1985, but a full-scale production facility does not yet exist and requires 26 months to complete. If funded this year, the first bombs would be produced at a low initial rate by September

1987, and at full rate by September, 1988.

2. *The M-687 155 mm artillery round.* Development of this projectile began by the Army in 1968 and was completed in 1976. It has an effective range of about 22 kilometers, and produces the nonpersistent nerve agent GB. Each round sprays chemical agent before hitting the ground, and is lethal over a limited area. Agent is produced by the mixing during the shell's flight of the contents of two canisters. One canister containing OPA, a mixture of two commercially available industrial chemicals (isopropylamine and isopropyl alcohol), and the other a substance similar to common insecticides, DF (methylphosphonic diflouride). Membranes separating the two canisters rupture on the impact of the shell's being fired. The process is much simpler than that of the Bigeye bomb.

A plant to produce DF, the less common chemical component of the M-687, was completed at Pine Bluff, Arkansas, this year. If production is authorized, an additional plant to produce a precursor ingredient of DF will have to be built after the current one-year supply is exhausted. A metal parts production line was completed at the Louisiana Army Ammunition Plant in Shreveport, Louisiana, in June 1984. If authorized this year, production of the complete round can begin by September 1987.

3. *The XM-135 MLRS (multiple-launch rocket system) chemical warhead.* This is a chemical-armed version of a new battlefield rocket able to reach targets at a distance in the range of 30-50 kilometers. It would deliver a semipersistent nerve agent, again by the reaction in flight of two relatively harmless chemicals that then are sprayed over the target area. The MLRS could be fired singly or in salvos of up to twelve from a single launching mechanism. Development by the Army began in 1981. The Department of Defense estimates that the development phase of the MLRS can be completed and production underway by 1990. The chemicals planned for the MLRS are essentially the same as those for the M-687 artillery shell, and would be produced at the same facilities.

For all three of these munitions the Department of Defense would procure only a limited number, considerably less than the number in the current inventory. Most or all of the existing

chemical munitions, as discussed later in this report, would be destroyed over a period of several years.

Proposed Expenditures

The President's current (Fiscal Year 1986) budget request is for $1.3 billion for all programs related to chemical warfare, plus an additional $64 million for maintenance and guarding of the current chemical stockpile. Of that $1.3 billion, 73% ($936 million) is allocated to protective clothing and related defensive equipment, including $391 million for research on improved protection. Only 14%—$174.5 million—would be spent on production of binary weapons, allocated as follows:

Completion of Bigeye bomb production facilities	$109.1 million
Bigeye bomb production	43.7 million
M-687 artillery round production	21.7 million

An additional 3%—$32.9 million—would be spent on research and development for retaliatory systems, including $20.4 million for research and development of the MLRS. Finally, 10%—$132 million—is included for demilitarization and disposal of the existing U.S. stores of military chemical agents.

Total production costs projected for the binary 155 mm artillery shell, Bigeye bomb, and MLRS warhead spread over the next eight years are $2.259 billion for production, $178 million for research and development and $312 million for facilities.

Production costs are related to the quantity bought. The number of artillery shells and bombs purchased depends on assumptions about the nature and frequency of use, and also on whether the United States decides to stock a quantity sufficient to supply U.S. allies as well. The Commission found the figures on what quantities the military requires to be soft and uncertain. The further analysis which is necessary would not change the initial production amounts, but could affect procurement figures for the later years. More precise thinking and planning from the Department of Defense is needed as to how and in what quantities chemical weapons would be employed tactically.

In sum, the Commission's assessment is that the projected costs for chemical weapon modernization (facilities, produc-

tion, and research and development) in the Fiscal Year 1986 budget and the overall chemical weapons modernization plan are not unreasonable, and relative to other Defense Department expenditures are modest. They should be excluded from any across-the-board cuts in the defense program, because an improved chemical deterrent posture is essential to making defense expenditures effective overall. As noted later, the Commission has reservations about the relative marginal benefit of devoting additional large sums to chemical-warfare defense, and believes that if cuts in the chemical program must be made, they should come from portions of the protective-measures account rather than from the modernization and research programs, which offer a far higher deterrent payoff. Along with the modernization, the unsafe portion of existing chemical munitions should be disposed of promptly, even though to dispose of even a portion will be expensive—in the range of several hundred million dollars.

PART II
RESPONSES TO THE QUESTIONS PUT BY THE CONGRESS

8. ARMS CONTROL

The goal of the United States is to establish a dependable and verifiable arms control agreement that would completely and effectively ban chemical weapons, not just for the major powers, but for smaller countries as well. Multilateral negotiations to seek an arms control agreement have been under way in Geneva since 1980. In 1984, the United States proposed a comprehensive treaty text providing for on-site inspection.

In addition, since 1977 the United States has been conducting bilateral negotiations with the Soviet Union in search of a bilateral accord. The latter negotiations broke off in 1980 over the verification issue and in response to the Soviet invasion of Afghanistan. On U.S. initiative, bilateral discussions to support a multilateral treaty resumed in the summer of 1984.

Senior U.S. arms control negotiators informed the Commission that there are two obstacles to reaching an agreement

with the Soviets to ban chemical weapons. One is the lack of any ongoing U.S. chemical warfare program. With the United States producing no chemical weapons at all, and the Soviet chemical program active and their offensive capability growing, there is no gain to the Soviets in agreeing to a freeze.

The second difficulty in arriving at an acceptable chemical arms control agreement is verification. Chemical munitions plants do not stand out like intercontinental missile fields; they do not look much different from other chemical or pesticide factories. Often the same plant can be used intermittently for either a military or a civilian purpose. Finding a small secret facility in a country as large as the Soviet Union would not be easy; and although the Soviets are much more reluctant than the United States to allow on-site inspection, some Western countries fear that the Soviets also might seek to use blanket on-site inspection rights to demand access to the most sensitive non-chemical military installations. Verification is crucial because the Soviets already have repeatedly violated both the Geneva Protocol of 1925 and the Convention on Biological Warfare of 1972—neither of which has verification provisions. To date, the Soviets have opposed meaningful on-site verification procedures.

Recognizing that arms control negotiations are ongoing, it is natural to ask, why not wait a while for chemical munitions modernization? Why not give the arms control process more time?

To this understandable question, the Commission is impressed by two answers:

First, much time already has been given. The negotiations began as early as 1972. There is no reason to believe that much progress is about to be achieved. Prospects, in fact, are dim. Verification of chemical weapons capability, because chemical weapons are so simple and easy to produce, is a far more difficult problem than even verification of strategic nuclear arms. U.S. negotiators expect the negotiations to be, at best, extremely long.

Second, U.S. commitment to production is more likely to encourage the arms control talks than to impede them. That is the assessment by this country's own diplomatic and arms-control representatives, and we are informed that it is shared

by several U.S. allies as well. So far the only times that the Soviets have budged from intransigence in the negotiations for a ban on chemical weapons have been when it appeared likely that the Congress would approve increased U.S. efforts in this area.

The Commission heard from witnesses who urged continued nonproduction by the United States, but none provided any evidence to suggest that the Soviets in such matters respond to unilateral abstinence by the United States, and none proposed a surer way to deter the Soviets from chemical warfare than by maintaining an effective U.S. chemical capability. The United States unilaterally abandoned chemical weapons production sixteen years ago. The Soviet response was a massive chemical weapons buildup and even actual use of these weapons.

If the United States does nothing to attain an effective chemical warfare capability, then the Soviets will continue to enjoy all the benefits of a chemical weapons freeze without having to restrain themselves by treaty. United States modernization will not add to verification problems. The Commission is confident that production by the United States of an effective chemical retaliatory capability will not retard arms control. Such commitment, which is needed to repair a serious gap in the U.S. deterrent posture, will if anything encourage arms control negotiations.

9. DETERRENCE

The Commission was asked also to consider the deterrent capability of present U.S. chemical weapons.

The Morality of Deterrence

The Commission wishes to begin by noting that it is sensitive to the moral issues involved in chemical warfare. Although chemical munitions were first employed three generations ago, there has been a consensus among civilized people that such weapons, especially in view of their indiscriminate destructive impact on noncombatants, exceed any rational tolerance level even in modern warfare. The use of chemical weapons was outlawed in the Geneva Protocol of 1925, to which the United States and the Soviet Union are both signatories reserving the right of use only in retaliation.

The fact that these weapons are horrible and fearsome, however, does not spare us from thinking about them. Ignoring chemical warfare will not make its threat go away. Rather, the task is to look at the problem clear-headedly and seek to find the best way of preventing chemical warfare from occurring.

The debate between proponents and opponents of modernization too often has been reminiscent of two darkened ships passing in the night. Some proponents have assumed that logic requires the United States to mimic militarily whatever the Soviets do. Some opponents have described deterrence as a "failed policy" and suggested as an alternative unilateral chemical disarmament, perhaps coupled with deterrence that

relies on the threat of nuclear war. Other opponents have given lip service to deterrence but have preferred to resolve all doubts against the evidence of Soviet activity and intentions, and in favor of the imagined ease of countering chemical munitions with protective clothing. Others have ignored serious inadequacies of the current U.S. stockpile.

For these reasons the Commission has spent considerable effort in assembling the facts, and in asking witnesses to make explicit the assumptions about history and human and national psychology from which they proceed. The Commission comes down in favor of non-nuclear deterrence through maintaining a sufficient chemical retaliatory capability—not because this is the only conceivable approach, but because it is the safest, and the only one that in the Commission's view offers persuasive evidence from experience to support it.

Sixteen years of unilateral restraint by the United States may have been a noble and acceptable experiment in 1969. But we cannot help observing that now in 1985 this country and its allies have nothing to show for that unilateral restraint except enormous Soviet activity designed for military use of chemicals, with heightened risk not just of chemical warfare, but also, if no adequate chemical retaliatory capability exists, of such warfare leading to nuclear war. To disarm unilaterally in the face of an adversary's continuing military buildup may represent in the short run, as some have called it, a "moral high ground." But if sixteen years of unilateral restraint draw no response other than an ominous Soviet buildup and consequent military imbalance that increases every year, then the truly moral decision is to deal effectively and restrainedly with the situation and trends that exist.

Lacking unique insights into morality, the Commission has had to address the objective facts. We have not been unmindful of the revolting nature of chemical warfare, and our fervent desire is that it never happen. What the facts lead us to conclude is that an adequate retaliatory capability is the most prudent way to prevent chemical warfare (and perhaps nuclear conflict as well) from occurring. Experience confirms that deterrence works. In most dependably avoiding such terrible eventualities, while observing the Geneva Protocol, it constitutes the true "moral high ground."

Deterrent Capability of the Current U.S. Stockpile

The specific question posed by the Congress is whether the chemical weapons this country possesses are sufficient to deter the Soviet Union from resorting to chemical warfare. The answer, while negative, is not completely so. Some of the chemical weapons that the United States has are effective, even though their deterrent force presumably is waning as they age. Some of these weapons are deployed in Europe, the region where the need for retaliatory capability is the greatest.

General Bernard W. Rogers, the Supreme Allied Commander in Europe, has stated that existing U.S. chemical weapons "still have a deterrent value, and the Soviets know that." However, he emphasizes that the deterrent value decreases with each passing year, as the weapons become increasingly obsolescent. Chemical warfare capability, he believes, is today the greatest gap in NATO's defense posture. Other senior U.S. commanders are even less sanguine, and question whether even now the deterrent power of U.S. chemical weapons in Europe—which lack capability to be employed against long-range targets—causes the Soviets much concern for retaliation in kind.

In terms of quantity required, it has not been demonstrated to the Commission that the number of artillery shells on hand is inadequate. Even if only those containing nonpersistent GB are counted, the quantity still is very substantial. Whether it is large enough of course depends on how many are needed, and current calculations of requirements are not convincing. If one compares existing stocks with the number of new binary artillery shells requested by the U.S. Army only, current stocks appear numerically adequate, though not with respect to type of agent. To distribute the existing unitary rounds in peacetime, of course, presents enormous safety and security problems. The very fact that unitary munitions are so inherently hazardous keeps them from being widely deployed, and thus reduces their deterrent value. Most importantly, for the intermediate-distance and longer-range battlefield missions, the United States has no effective chemical weapons, and thus

the most significant capability needed to deter chemical attack is missing.

A number of observers contend that if the Soviets decided to take the risk of starting a conventional war in Europe, they would not hesitate at the additional step of using chemicals, particularly because quick success would probably be central to their planning. Such employment of chemicals, it is argued, could be deterred only if the Soviets saw their doing so as bringing with it the extra added cost of effective U.S. retaliation. Some U.S. military leaders question whether the Soviets would employ chemicals at the outset, but have little doubt that if a Soviet attack bogged down, the Soviets would turn to chemical warfare rather than be halted.

Of the witnesses who testified against modernization, some acknowledged the need for a retaliatory capability, but argued that the existing U.S. chemical weapons are adequate. On the other hand, several witnesses who opposed modernization of the United States stockpile took the position that although deterrence required imposing an added cost on the Soviets for resort to chemical weapons, the way for the United States to deter Soviet chemical warfare was to threaten to respond by initiating nuclear war. After all, the stated U.S. policy for many years has been that we would use nuclear weapons to prevent Western Europe from being overrun even by a conventional Soviet attack. Use of nuclear weapons to respond to a chemical attack is already the announced policy of the French government.

The Commission believes that this country's nuclear threat probably does inhibit Soviet chemical warfare to some degree. However, the Commission believes that the United States should be seeking ways to avoid resort to nuclear weapons, rather than to broaden reliance on them to include deterring chemical attack. The United States and its NATO allies maintain substantial conventional forces in Europe for exactly the purpose of keeping the nuclear threshold high. To rely solely or even principally on nuclear weapons to deter chemical warfare is totally inconsistent with that policy.

Moreover, relying on the threat of nuclear retaliation is dangerous—either because it makes nuclear war more likely; or because the disproportionality of a nuclear response to a

chemical attack makes such a nuclear response less credible. The political difficulty of turning to nuclear weapons would be especially great if the Soviets employed chemical warfare only on the flanks of NATO—for example, against the large and mostly unprotected Turkish army, or against key air bases in Iceland that guard the Atlantic approaches to Europe. And the Soviets might also doubt whether NATO would choose nuclear war even in response to a chemical attack on the central front in Europe, if that attack were confined, for example, to a few locations, or to the forces of a single NATO country—whose collapse could lead to encirclement of the entire allied front. Also, unlike the 1970's, now the Soviets have achieved quantitative superiority in theater nuclear weapons, making the deterrent value of U.S. nuclear weapons that much less. The threat of nuclear response is neither a sufficient nor a desirable deterrent to Soviet chemical warfare. And it would be ironic and tragic indeed if the United States allowed the lack of a sufficient chemical retaliatory capability to become the trigger for nuclear war.

10. THE BINARY MODERNIZATION PROPOSAL

The Commission was asked whether the binary modernization program proposed by the Department of Defense will provide an adequate deterrent to Soviet chemical warfare. The Commission has concluded that the binary modernization program is an important and necessary step in that direction. Alone, however, binary modernization cannot guarantee deterrence of the Soviets from chemical warfare over the long run.

At the outset a distinction must be drawn between the concept of binary munitions, and the three particular programs that the Department of Defense has proposed. The binary concept—weapons with two separate chemical components, each of which is relatively harmless until they are combined after the launch of the weapon—is not a new, more destructive, chemical technique. Binary chemical weapons are no different in effect from their unitary antecedents. In fact, the chemicals they release—GB or VX—are exactly the same.

The argument for binary weapons too often has been misconceived. Proponents of the binary program sometimes have argued that new chemical weapons are needed to replace the current unitary stock because the latter is obsolete and outmoded (which, by and large, it is). Yet some of the same individuals point with alarm to the formidable Soviet chemical weapons stockpile—all of which, as far as we know, consists of unitary weapons.

What binaries do offer is an advance in safety of production, storage and handling, as well as in ease of future disposal when required. The present chemical munitions—unitary weapons which contain the toxic agent in lethal form inside the artillery

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shell or bombs—are inherently dangerous, and difficult and costly to store, particularly in confined areas that might come under enemy fire, such as the magazine of a ship. Binaries are simply a desirable move toward safety, transportability, and lessened environmental danger.

The difficulty with the current U.S. stockpile of chemical weapons is not its unitary character, but rather the following:

First, the stockpile is aged and insufficiently tested, and therefore its reliability is increasingly doubtful.

Second, the U.S. stockpile does not contain enough munitions whose agent persistency is suited for modern military use. The match of persistency of the chemical to the particular munition containing it is often wrong. For example, the U.S. has no chemical ordnance that could effectively lay a persistent nerve agent (such as VX) on an enemy air base launching sorties against Western Europe. Today the United States has no air-deliverable chemical weapons that constitute a credible threat. Also, nearly two-thirds of the 155 mm and 8-inch chemical artillery shells contain a persistent agent, when for their mission a nonpersistent one is required. (That does not mean, however, that the threat of an artillery barrage of a persistent agent has no deterrent value, particularly when friendly forces are in a defensive posture and do not intend to occupy the contaminated area.)

Third, the United States does not have, and has not been devoting sufficient effort to developing, better delivery systems—battlefield rockets, air-to-surface missiles, surface-to-surface missiles—that would make the U.S. chemical deterrent threat more coherent and credible.

Whether the United States builds chemical weapons of binary design has some military impact, but it is basically a safety and environmental issue, albeit an important one. Whether the United States acquires chemical weapons in delivery systems that are easily and safely transportable and that could retaliate effectively on the battlefield is the central question. The Commission believes that, for purposes of deterrence, such a capability exists only marginally now and should be attained. It appears to the Commission also that the safest and most prudent way to obtain the needed capability is not to build additional unitary weapons, but rather to go forward

with the much safer and environmentally less threatening binary weapons.

The particular weapons that the Department of Defense has requested—production of the M-687 binary 155 mm artillery shell and the BLU 80/B binary Bigeye aerial bomb, and advanced development of a battlefield rocket system—are not in themselves the ideal solution to providing the United States with a safe and credible chemical deterrent. The shell and bomb both are the products of 1960's technology, and military weaponry and assumptions have altered in the meantime. The rocket is still in the development stage, not yet ready for production.

In terms of military needs, the requirement for an effective munition for striking enemy targets at greater range is more urgent than the need for improved front-line artillery. Artillery shells have to be distributed from central supply points to batteries across a front, which is no simple task whether they are binary or not, though transporting binary shells presents no hazard. Air-deliverable ordnance, by contrast, can be placed at a few airfields, even those in the United States. Though it is far from ideal, the United States does possess some short-range retaliatory capability in the present unitary artillery shells. If the sole measure of deterrence were to be able to force the enemy to the impediment of wearing protective clothing, to a degree that exists now.

However, the United States' chemical deterrent is seriously incomplete. The United States has no effective means of delivering chemical munitions against rear-area military targets—enemy airfields, logistics concentrations and command centers—targets whose neutralization is absolutely crucial to success of a NATO defense of Europe. There are no effective delivery systems for targets just beyond the range of front-line artillery, about twelve kilometers from the forward line. And there is no seagoing chemical deterrent, suitable for naval gunfire, missiles or carrier-based aircraft. If the measure of deterrence includes ability to retaliate effectively throughout the depth of the battlefield, that capability is lacking.

The United States should produce and store binary weapons, and concurrently commence destruction of its stockpile of unitary weapons, in order to meet the three basic tactical

mission goals of short-range, intermediate- and long-range capability. Of those three, the long-range mission for which the Bigeye bomb is intended is the most urgent.

The Commission believes that all three programs should be funded and expedited, and also that accelerated destruction of the existing unitary stockpile should commence. The Bigeye bomb program should receive the highest priority, because its mission is militarily the most crucial and yet is not provided for with today's stockpile. Replacement of the artillery shells should have the lowest priority of the three.

The Commission also believes that the aircraft-dropped Bigeye is not the optimal solution for the longer-range battlefield mission. Even with well-developed toss-bombing techniques, which permit aircraft to stand off two to four miles from the target, fighter-bombers nevertheless may be exposed to modern antiair defenses, so that there is risk of loss and mission failure. Unmanned delivery methods—such as an air-to-ground missile with a range of fifty to one hundred miles, a relatively simple short-range ballistic missile, a cruise missile—are also required, in order to strike military targets without the hazards and uncertainties of risking manned aircraft. This need, which the Soviets have filled with their 45-mile FROG and 115-mile SCUD missiles, up to now appears to have been neglected by U.S. military planners.

The Commission has been unable to determine with certainty why the Soviets have not adopted binary weapons. The answer cannot be offensive restraint, because the binaries are no more destructive than unitaries. The explanation may be simply that safety of handling and eventual demilitarization, which is the binaries' outstanding advantage, is not a high concern for the Soviets. Having produced a large family of unitary weapons, the Soviets apparently see no need to develop a slightly more complex but militarily no more effective system, simply to avoid concern about accidents.

The production of binary weapons need not add to the stockpile of lethal chemical weapons; on the contrary, after destruction of current stocks, the binary stockpile would be smaller than the present one. Current law, in fact, already requires that a serviceable unitary artillery round be demilitarized for each binary munition that is produced. The great advantage of

binary weapons is safety to the Americans who produce, ship and handle them, and also the enormous later benefit that, because the separate components are not highly toxic, unlike unitary weapons they do not ultimately burden American society with a difficult and costly problem of disposing of toxic waste.

11. DEFENSIVE TECHNIQUES

The Congress' final question is whether defensive measures alone can meet the Soviet chemical warfare threat, and whether such measures are adequately funded.

It does not follow, simply because the Soviet Union has developed a formidable offensive chemical warfare capability, that the United States should do the same. Deterrence theoretically might be achieved by defensive measures against Soviet chemical weapons. The Commission has concluded, however, that in spite of the approximately $4 billion that the Congress has appropriated since 1978 for defense against chemical warfare, that defense, measured either for purposes of deterrence or for war-fighting utility, is not adequate today and is not likely to become so. Chemical combat as it would exist in the late twentieth century is an arena in which—because defense must be nearly perfect to be effective at all, detection is so difficult, and surprise offers such temptation—the offense enjoys a decisive advantage if it need not anticipate chemical counterattack. Defense continues to be important to pursue, because it can save some lives and preserve some military capabilities. But for this country to put its faith in defense against chemical weapons as an adequate response to the Soviet chemical threat would be a dangerous illusion.

Adequate chemical defense involves three elements: detection, protection, and decontamination. None is fully satisfactory today, and there is no evidence that an adequate combination can be developed in the near future.

The greatest fear of U.S. military officers is that with the

growing imbalance in respective chemical capabilities, even a threat of limited Soviet use of chemical weapons will force U.S. troops to don cumbersome protective gear. The Soviets are able to fight without such a burden, because they know which areas to avoid, or can target their chemical attack on U.S. rear areas beyond the immediate line of Soviet advance. As one officer explained it, for his troops to try to survive and fight encumbered by protective garments against an unencumbered enemy would be like starting out with half as many men, or with 50% casualties.

It is difficult for one who has not worn and experienced the protective garb—even in an environment free of the lethal danger of poison gas—to comprehend its discomfort, its awkwardness, its psychological oppressiveness, and its impact on operational effectiveness. Protective clothing reduces mobility, dexterity, vision, hearing, and ability to communicate. Based on limited experiments, U.S. commanders believe that even if the gear succeeded in keeping out toxic agents, their troops' efficiency would be degraded by from 30% to 80%, depending upon training, temperature, time in protective clothing, and the nature of the activity. For example, experiments have shown that U.S. Army tank crews when encased in chemical protective gear take longer to find and fire at their targets, a potentially fatal deficiency in tank battles. Performance of other combat operations is similarly degraded.

How computer operators would function in as many as three layers of gloves is a mystery. How members of an infantry platoon could recognize and hear each other, maintain cohesion (especially after the casualties and confusion common to war occurred), give and receive orders, and function as a coherent unit is also difficult to visualize. Ordinary infantry tactics calls for spreading out; in protective suits, soldiers will tend to cluster together in order to communicate. Simple and frequent bodily needs like drinking, eating, and elimination would become major preoccupations. Heat exhaustion quickly becomes a problem for an active soldier at any temperature above about 65°F. NATO aircraft, already outnumbered in Europe, would have to return to contaminated bases for refueling and servicing; their turnaround time would slow with maintenance crews in protective gear. Because nerve agents

constrict the pupils, even a brief nonlethal exposure may prevent pilots from flying. Care of the wounded would be extremely difficult. Usually to be wounded in a toxic environment would mean to be killed.

U.S. chemical protective clothing has been and is being improved, but still is far from satisfactory. Army, Marine Corps and Air Force garments cease protecting after about six hours of exposure to liquid chemical agents; then a new suit is needed. (British models last 24 hours; the U.S. Navy purchases its protective suits from a British manufacturer.) The U.S. Army's current infantry mask is designed so that there is no way to change the charcoal filter on the gas mask without removing the mask itself; a planned replacement will correct this. The rubber boot covers that are part of the garment are awkward, poorly designed, and tear quickly under force of running or scraping. To visualize troops effectively fighting in such equipment—when all their senses are diminished, and when they are warned during fitting not to jostle the rubber masks even against their shoulders lest the seal be fatally broken—is, the Commission believes, a concept based on faith rather than reason.

Although there are obvious areas for improvement in U.S. protective clothing, and these are being pursued, the basic and unavoidable difficulty is that protective measures, if they are to work at all, must work perfectly. Protective clothing probably can save some lives and preserve some military capability for a while. But its utility is limited and diminishes over time. And this assumes, of course, that the clothing, which takes minutes to put on, will be in place to counter the Soviet nerve agents, which take effect in seconds.

The foregoing also assumes the use by the Soviets of a familiar toxic agent, rather than any of the several possible added ingredients—mask penetrants or new chemicals—that would render most mask filters ineffective. Hydrogen cyanide, which the Soviets already have in their chemical arsenal, can degrade U.S. filters. Also, there is convincing intelligence that the Soviet Army has been experimenting with new toxic agents on a considerable scale. It would be imprudent not to assume that the Soviets will soon develop a chemical agent able to defeat current U.S. and allied protective measures.

The Soviets appear also to be developing explosives that spray needle-like flechettes to pierce holes in U.S. protective garments.

U.S. Army tanks and vehicles themselves, unlike the new Soviet models, do not protect their riders from gas attack; the M-1A1 U.S. model, starting production in 1986, will have collective protection features. U.S. aircraft and naval vessels scoop in outside air. In the event of a chemical attack, U.S. naval units would plan to leave the area; modern Soviet warships are designed to continue operating with chemicals present, and their crews conduct chemical warfare drills. NATO headquarters and command centers behind the forward lines are not adequately protected against chemical attack.

Detection of a chemical attack—in which there may be only seconds to put on a protective mask—is a gaping deficiency in the U.S. defensive posture. Today the U.S. Army's field capability for detecting liquid agents is confined to a soldier in protective clothing walking around with a piece of detector paper stuck on the end of a stick. Current U.S. field detection equipment for nerve gas is bulky and delicate, and cannot detect other kinds of toxic agents. Although newer detection gear is being developed, it is not likely ever to be possible to deploy one device sophisticated enough to detect all of the agents that the Soviets might employ.

Detection is particularly important because there is no way known today to immunize in advance against nerve agents. One desperate remedy is to inject atropine along with the oxime 2-PAM-chloride. If administered quickly, these may prevent death of a person already exposed. Unfortunately, they leave the victim dehydrated, incoherent and mentally disoriented, though capable of surviving with subsequent hospitalization. If the injection is made in the erroneous belief that nerve gas exposure has occurred, the subject may be seriously harmed from the injection. Besides the fact that it is not totally effective and can itself cause casualties, atropine is not satisfactorily effective against GD, the nerve agent used in most Soviet chemical weapons. No antidote is available for the blood agents that are also in the Soviet arsenal.

As for decontamination, the United States unlike the Soviets does not have military units equipped with hundreds of

special vehicles and decontamination liquids. Moreover, the decontaminant substances are so corrosive that they damage whatever they touch. Aircraft interiors simply cannot be decontaminated at all. To purge the inside of a tank contaminated even with a nonpersistent chemical can take up to twenty-four hours. Because Soviet tanks and many Soviet vehicles are pressurized, they do not require internal decontamination.

Within the next few years the U.S. armed forces expect to have an improved protective mask; a remote chemical detector that can scan a distant cloud and identify its composition; collective protection modules that can be installed on existing equipment; and more versatile decontamination devices. However, even this new equipment will not dramatically change the difficulties of defense against chemical attack.

Recognizing these unpleasant realities, commanders emphasized over and over that U.S. chemical deterrence is needed so that the enemy knows that if he initiates chemical warfare, he will have to expect chemical response and therefore fight in protective equipment also. Indeed, it may be that if both sides must use protective garments the attacker, which must exert itself and maneuver more, will be more impeded. Hence, an effective NATO retaliatory capability might be particularly discouraging to Soviet military planners, and all the more effective as a deterrent.

A final reason why military protective clothing and shelters are not an adequate answer to the Soviet threat is that defensive measures give no protection to noncombatants. There is no practical way to protect civilian populations adequately against quick-acting Soviet chemical agents. Even if military personnel survived, civilians in areas that were attacked by chemical munitions would be without protection. This civilian population includes the 170,000 dependents of U.S. servicemen and 100,000 civilian employees who live in the Federal Republic of Germany, unless they were evacuated before a chemical attack occurred. Chemical weapons, though harmless to buildings and land, and to military personnel with adequate protection, are indiscriminately fatal to noncombatants. That reality unfortunately underlines the need to field an effective means to deter the use of chemicals in the first place.

PART III
ADDITIONAL CONSIDERATIONS

12. COST

The cost of modernization of the U.S. chemical stockpile is relatively small. It amounts to $174 million in the President's proposed FY 1986 budget, with a total program cost (for total production of three munitions—the 155 mm artillery round, the MLRS rocket, and the Bigeye bomb), at $2.3 billion, spread over eight years.

No one can treat casually, in a time of budgetary restraint, any expenditure that is counted in the millions of dollars. However, not all defense expenditures are of identical urgency. The Commission has concluded that the $174 million proposed for the chemical weapons modernization program should have an extremely high priority. This sum amounts to about one-twentieth of 1% of the Administration's proposed defense authorization, and equates approximately to the purchase of four additional F-15 fighter aircraft, one-tenth of a DDG-51 destroyer, or 15 Apache helicopters—any single item of which we believe is a lesser priority. Viewed another way, the proposal of $174 million for chemical weapons moderniza-

tion can be compared to $4.0 billion requested for Fiscal Year 1986 for the MX missile, $6.2 billion for the B-1B bomber, or $3.7 billion proposed just for research on the Strategic Defense Initiative. If the President's defense request for Fiscal Year 1986 is to be cut, the chemical weapons modernization request is not the place where cuts should be taken.

Although all the programs mentioned are intended to contribute to deterrence of nuclear war, the continuing imbalance in U.S.-Soviet chemical warfare capabilities, besides inviting Soviet first use of chemical weapons, also lowers the nuclear threshold. In light of the many billions proposed for strategic weapons systems as a deterrent to nuclear war, surely it is not illogical to allocate to chemical weapons modernization a relatively modest sum that will serve to make both nuclear and chemical warfare less likely.

If it is decided that budgetary constraints require cuts in the military chemical program, the Commission recommends that they be taken in the large portion of the total—nearly $1 billion—requested for research, development, and procurement of protective clothing, masks and shelters in the coming year. The marginal payoff of those dollars spent on chemical defense is less significant than the gain from the relatively small amount requested to begin modernization the of U.S. retaliatory capability.

The chemical deterrence situation is far from hopeless. The United States has a good chance to succeed in deterring use of chemical weapons if we maintain a modest, effective chemical retaliatory capability, for the principal military missions. A large quantity of these weapons is not required, but to have some is necessary. In the context of this country's numerous defense programs, many of which buy far less protection for the money, the cost is small.

13. ENVIRONMENT AND SAFETY

Environmental aspects of chemical weapons come into play with respect to both the existing stockpile and the proposed binary alternative. They concern manufacture, storage, shipment, and ultimate destruction, and also the virtual inaction that has been encouraged by environmental legislation and regulations of the past two decades.

MANUFACTURE

The ingredients of the binary munitions are not highly lethal. Although some are toxic, they are comparable to many chemicals used in ordinary commercial manufacturing processes and to common insecticides or strong solvents. The production of such agents is no more of a hazard than is usual for modern chemical plants, less than for many industrial products.

Environmental protection laws enacted since chemical weapons production ceased in the 1960's mean that future production of the chemicals for binary weapons will be much less damaging to the environment and less dangerous to safety than were earlier production methods. The plant at Pine Bluff, Arkansas, which is now ready to begin production of chemicals for 155 mm shells, meets all waste-treatment, pollution-control, and worker-safety requirements of the Environmental Protection Agency and Occupational Safety and Health Administration. In fact, more than one-third of the cost of the facility was incurred to meet those standards.

STORAGE AND SHIPMENT

Chemical munitions and agent are stored at Tooele, Utah;

Pine Bluff, Arkansas; Lexington, Kentucky; Edgewood, Maryland; Pueblo, Colorado; Umatilla, Oregon; Anniston, Alabama; and Newport, Indiana, in the United States, plus Johnston Island in the Pacific, and in Europe. Most of the munitions are stored in relatively isolated locations. Almost half of them are at the U.S. Army depot at Tooele. All of the chemical weapons in the United States are stored in ammunition bunkers guarded by civilian security personnel. They are not under the special security applicable to U.S. nuclear weapons. No efforts by intruders to reach the munitions have occurred. Security at Johnston Island, where storage facilities have been less adequate, is being upgraded.

The weapons in storage for the most part do not pose safety or environmental hazards at this time. The agent they contain, however, is far more lethal than that which caused multiple deaths in the industrial accident at Bhopal, India, in 1984. In 1983 several panels of scientists studied the portion of the chemical weapons stockpile stored in the continental United States and reported that it was being safely maintained. But they noted that the M-55 rockets in the stockpile should be "demilitarized"—that is, have their chemical fill destroyed—as quickly as possible. These munitions, which are useless militarily, have deteriorating aluminum skins and were manufactured with bursters in place, which makes it theoretically possible for them to detonate accidentally, although this has not occurred. A few of them have developed leaks that permitted release of agent inside their metal packing cylinders. When a leaking rocket is discovered, it is sealed in a heavy steel cylinder to await destruction.

Because of legislation restricting testing and transportation, there has been virtually no movement (except within individual storage depots) of chemical weapons since 1969, with the most notable exception being 888 Weteye bombs, which were moved by aircraft and truck from Denver, Colorado to Tooele, Utah, in 1981. Unless future shipments take place, very expensive disposal facilities will have to be built at every stockpile location (after tedious and costly environmental impact statements, and subject to varying state laws, unless Congress modifies existing requirements, as it might well consider doing). Safe shipment should be planned insofar as it may be necessary to expedite the destruction process.

DESTRUCTION

Most of the existing chemical munitions are stored in earth-covered bunkers where they are safe for the foreseeable future. Although there is general agreement in the scientific community that the destruction of existing chemical munitions by incineration is safe, it is not immediately necessary to destroy them all, and costs of doing so would be extremely high. However, some items, such as the M-55 rockets, are dangerous and should be destroyed without delay. Environmentally acceptable methods for destroying nerve agent are expensive and slow. Those for mustard agent are also difficult. The annual cost of storing existing unitary chemical munitions is estimated at $63.8 million for the coming year, about 60% of it for security. But unless and until some of the current storage areas are totally closed, security costs (which for binaries stored alone would be less) will not diminish.

A special committee of the National Research Council in 1984 conducted a thorough study of techniques for disposal of the chemical weapons stockpile. It and other scientific panels have recommended incineration as the best means of destruction, and the Army now favors this method over chemical neutralization or other possible approaches.

Destruction of the stock of old chemical weapons has not received a high priority. An experimental incinerator with special disposal features has been constructed at Tooele, Utah, and is now in operation on a test basis. There is also one mobile fifteen-trailer unit called the "Drill and Transfer System" for disposing of individual leaking munitions at the other sites where they are stored. It is currently located at the Army Depot Activity at Umatilla, Oregon. The mobile facility is unsatisfactory and should be deactivated. In 1982, it occupied about thirty people working for a full year to destroy just 165 rockets and projectiles. Speed has not improved much since, and in the course of its operations at least two soldiers were exposed to nerve agent. By this makeshift system it costs approximately $15,000 to dispose of one round of ammunition.

The Tooele incinerator is being used principally to test various disposal techniques. The Army also is constructing an incinerator at Pine Bluff, Arkansas, to dispose of BZ bombs, a

process which at present schedules will begin in 1987 and take until 1988. A third destruction facility is being planned for Johnston Island, with operations to begin in 1988.

The Army is undecided whether to build destruction plants at the other sites where chemical weapons are stored, or to undertake the burden of moving them to existing incinerator locations. The cost to destroy the entire stockpile is estimated at $1.9 billion, in addition to the $624 million already spent. The Commission expects that the actual cost of destruction would far exceed that estimate, perhaps by two- or threefold.

At the present slow rate, it will be 1994 before just the M-55 rockets, the most hazardous chemical weapons from a safety standpoint, will be destroyed. To destroy the rest of the old munitions at present rates will take until the year 2000 or beyond. The Commission has concluded that this schedule should be greatly accelerated, in order to complete the job during the next decade. However, the existing bulk nerve agent, which could be used to fill new munitions in an emergency, should be retained for that contingency until binary weapons are available. At a future date when the special incinerators have destroyed the desired portion of the stockpile, they should be made available to help dispose of the country's civilian toxic wastes.

It is a regrettable irony that the accumulation of environmental laws and regulations of general application has made much more slow and difficult the task of destroying environmentally repugnant chemical weapons. These provisions include the National Environmental Policy Act of 1969 (Public Law No. 91-190), the Resource Conservation and Recovery Act of 1976 (Public Law No. 94-580), and several others, as well as Executive Orders which made them applicable to agencies including the Department of Defense. Some of these provisions do not set standards, but simply require complex procedures that result in delays of years before necessary action can be taken. The Commission firmly believes that destruction of chemical weapons should and can meet high standards of environmental protection. The Congress and the President should consider adjustments to existing procedures for this purpose that will best balance the needs both for safety and for speed.

Environmental Advantages of Binary Munitions

Manufacture, shipment, storage and destruction of binary weapons, if they are built, will pose no safety problem, because they contain only the same kinds of chemicals that travel the nation's highways and rails every day, less dangerous than, for example, common shipments of chlorine or sulfuric acid. The components of binary weapons would also have to be disposed of eventually—when a ban on chemical weapons is established by treaty, or because of eventual age or obsolescence. However, destruction of binary components would be relatively easy, because no nerve agent or other deadly chemicals would be involved. Following the destruction there would still be, as there is now with the destruction of nerve agents, the task of dealing with quantities of phosphate salts, an end-product of destruction that is harmless in small quantities but, like detergent residues, ecologically damaging in large amounts. They could be stored permanently or recycled for industrial use. The enormous difficulties and expense of destroying the unitary weapons are, the Commission believes, an impressive testimony that new chemical weapons should be, as the binaries are, a kind that will never present such costs and hazards.

Production of binaries, coupled with an orderly destruction program for the unitary munitions, could lead to a day when we no longer have nerve agent stored in the United States. In fact, the Congress could specify a rate of destruction tied to the rate of production of binary weapons. That would be a great step forward environmentally, while providing a more stable deterrent posture as well.

14. DEPLOYMENT AND ALLIES

In recommending production of binary chemical weapons, the Commission does not deem it essential that they now be deployed in foreign territory. Binary munitions are much more safely and easily transportable, because the two non-dangerous parts can be shipped and stored separately, perhaps at different times. There is no need, nor is it recommended, to seek concurrence of U.S. allies in this production. Discussions by members of the Commission with representatives of a number of allied governments support this conclusion.

Allied governments, which depend on the United States for deterrence through retaliation, have emphasized the need for deterrent capability rather than deployment. For example, in its most recent official White Paper statement of defense policy, the Federal Republic of Germany has stated that it "considers it indispensable for NATO not only to improve its defense capabilities against such weapons, but also to maintain a capacity for reprisals, albeit limited in size." The Supreme Allied Commander in Europe, General Rogers, in whose region of responsibility the most likely overseas deployment would take place, has explained that he believes modernization and production to be the essential addition to deterrence, with deployment a secondary consideration. Several military leaders of other NATO countries told the Commission that they agree with that assessment. The Commission believes that the commitment to the capability to deter the Soviet chemical warfare threat will be welcomed by most allied governments, though probably not publicly applauded.

Because they are safer and easier to transport, binary chemical weapons, particularly bombs, could be transported quickly by air if necessary (perhaps stored near U.S. Strategic Air Command or Military Airlift Command bases), and deployed, perhaps afloat, even earlier in the event of a crisis, if adequate deployment plans and priorities were established. In that regard, it is essential that the Department of Defense develop detailed and realistic plans for deployment of binary weapons abroad in the event need arises.

15. RESEARCH, DEVELOPMENT AND TESTING

The Commission does not believe that the proposed programs to produce binary weapons are sufficient to maintain deterrence against Soviet chemical warfare over the long run. An essential element of that deterrence is the Soviets' respect for the technological capability of the United States. Yet during the sixteen years following President Nixon's announcement in 1969, the United States has continued only minimal military research in chemical warfare.

There has been little incentive for the Department of Defense to devote resources to the development of weapons that would never be produced. As a result, the United States has under way only three delivery systems—the 155 mm shell, the bomb, and—in development—the rocket—when more modern and appropriate delivery systems should be under development. The United States should be developing better delivery systems, such as air-to-ground missiles, particularly for the longer-range missions. The Air Force, however, is devoting minimal effort to developing modern chemical air-to-ground missiles. It has budgeted only $1.2 million for that purpose in Fiscal Year 1986, and does not foresee potential production until sometime after the year 2000. The Defense Department also should be considering whether to add a lethal gas to supplement the liquid VX agent in the Bigeye bomb, which attacks exposed skin but has little vapor effect, and hence does not penetrate ordinary buildings or Soviet aircraft shelters. Certainly the United States should be developing agents that can penetrate Soviet protective equipment, along with the systems needed to deliver them. Imagination has not characterized the U.S. chemical weapons program to date, and military planners have avoided the topic.

A vigorous research effort, both in chemical weapons and in defenses against them, is an essential part of a program to deter Soviet temptation to employ chemical warfare. Without such research, it is difficult for our military to remain knowledgeable about the likely developments in this area or to be prepared to counteract them. Research on offensive weapons constitutes a necessary element of our military posture and of maintaining a deterrent against new forms of chemical attack.

Research should also be conducted on non-lethal chemical agents. One such incapacitant, BZ, a drug similar to LSD, was actually produced and weaponized in small cluster bomb form by the United States in the early 1960's. It was abandoned because its effects were too unpredictable and its control too difficult. Incapacitants, besides vastly reducing civilian fatalities, may in some circumstances be more militarily effective than lethal chemicals. Soldiers who are unable to fight and who require attention are more of a burden to a commander than those who have been killed. Both humane considerations and practicality lead the Commission to recommend that research into possible nonlethal incapacitants also be pursued.

Testing in support of research and development can be safely conducted at Dugway Proving Ground, Utah, an isolated desert area larger than the state of Rhode Island. The Congressional limitation on testing that was enacted in 1969 emphasized concern about safety. The prohibition is not total; it permits the Secretary of Defense to authorize testing of chemical weapons (after consultation with the Secretary of Health and Human Services with respect to safety, and notice to the Congress) when he concludes that such testing is "in the interests of national security." Yet neither the present Secretary nor his predecessors has ever issued such a determination.

A moderate testing program could confirm the efficacy, assumed by the Commission, of the old unitary artillery rounds in the stockpile. It could also provide precise field operating characteristics for the binary weapons, which have been developed to a high degree of confidence using simulated chemicals. Perhaps most importantly, testing is necessary in order to prove in a realistic setting U.S. defensive equipment, including collective shelters and detection equipment. Testing in chambers is not adequate to assess how detectors and protec-

tive equipment would perform in outdoor battlefield conditions. Testing also is likely to produce new observations that will be useful to maintain a level of United States chemical warfare knowhow that is sufficient to deter the Soviets. In this connection, Dugway's desert test facilities should be modernized.

16. INTELLIGENCE

The depth and quality of U.S. intelligence on Soviet chemical warfare capabilities and intentions is not adequate. U.S. intelligence agencies for years virtually ignored the chemical and biological threat. Lately some improvement is evident, but not enough to provide detailed and up-to-date knowledge of Soviet chemical weapons capabilities. There is reason to doubt that if the Soviets achieved a sudden breakthrough in chemical or biological weaponry, the United States would learn of it. Also, intelligence on chemical warfare efforts of third-world countries is inadequate.

To the extent that the gaps in U.S. intelligence result from overdependence on photographic and electronic data gathering, and neglect of human intelligence sources, the problem may reflect a wider deficiency in modern U.S. intelligence methods that ought to be examined in a broader context. It is all too easy for intelligence analysis to concentrate on the data at hand, and ignore important areas simply because adequate information about them has not been collected. The magnitude of the Soviet chemical warfare effort, and, even more, Soviet biological warfare advances, appear to fit that characterization.

17. ORGANIZATION AND TRAINING

Current plans for bringing existing chemical weapons to the battlefront are inadequate. The senior U.S. combatant commanders outside Europe have no direct access to chemical weapons. To obtain the weapons, under current procedures, they must submit supply requisitions to the service logistics bureaucracies as if they were ordering gasoline or paper or ordinary ammunition. At best, it is estimated, a week or more would be required before the chemical munitions arrived where they were needed. Probably it would take much longer. Besides that, transportation arrangements to move weapons to the theater are also totally unclear, and there have been no complete exercises of the deployment process.

The Commission recommends that this bureaucratic complexity be remedied to give the other major U.S. theater commanders outside Europe a similar direct call on chemical munitions that they might need to bring forward promptly. Transportation plans and priorities for chemical weapons need to be prepared, whether for unitary or binary munitions.

The Commission did not undertake a thorough investigation into training for military operations in a chemical environment. Our observation is that training has improved markedly from the neglect that apparently was common several years ago, but that even more needs to be done.

18. BIOLOGICAL WEAPONS

The Commission's charter does not formally extend to the realm of biological weapons. Yet the nature of modern biochemistry, where daily press reports on "genetic engineering" and "designer drugs" are common, has blurred the line between the chemical and the biological. Toxins already occupy a middle ground. From the military point of view, the employment and characteristics of chemical and biological weapons have similarities that would make it artificial to look only at chemicals and pretend that the biological threat does not exist, and would be to ignore what may turn out to be the most serious aspect of the problem.

In 1969 the United States abandoned its research into biological weapons. Unfortunately, there is evidence that the Soviet Union has done just the opposite, and since the 1970's has been pursuing an active program of research into biological agents for military use. The exact scope and nature of the Soviet effort is unclear. The deaths caused by anthrax spread from a Soviet weapons laboratory in Sverdlovsk in 1979 are an example that this country cannot ignore.

The threat such Soviet activity poses is grave. The rapid advances of genetic technology—in which the United States for now is fortunately the leader—offer the predictable likelihood of new agents being developed for which no vaccines or counteragents are known or available. Moreover, unlike chemical research, even ordinary modern biological research often has direct and obvious military applications as well as perfectly legitimate peaceful ones.

Chemical weapons, because of the volume of agent required to cover a large area, are unlikely to be employed as strategic

weapons directed against homeland populations. The largest targets militarily attractive for them would be port facilities or other concentrations and bottleneck areas.

Biological weapons, on the other hand, could be designed to spread disease and kill indiscriminately in wider fashion, and thus are adaptable for targets far from one's own population. They could infect enormous areas. At the same time, the very lack of precise control of biological weapons makes their battlefield use less likely, as does the fact that, unlike most chemical weapons and toxins, biological agents usually have a period of delay before they take effect.

Perhaps most seriously, the Soviets also are believed to be pursuing development of both lethal and incapacitating toxins, that could produce, for example, sudden panic or sleepiness in defending forces. Toxins are of particular concern because they can be developed to be hundreds of times more lethal than agents in existing munitions, or to be less susceptible to countermeasures. Once developed, their manufacture is relatively simple, making proliferation a problem. Toxins often can be countered, however, if studied in advance and rapidly detected.

The Commission was warned eloquently by distinguished biological scientists that advances in biology are leading toward a danger of tampering with life itself, with consequent horrors difficult to visualize. The Commission was impressed with these warnings, and particularly with the evidence that the Soviet Union has not heeded them, and that the Soviets are conducting active research on how biological science advances might be turned to military ends. Representatives of other governments also expressed to the Commission their concern about Soviet biological warfare activity.

The only sensible response, we believe, is again for the United States not to ignore the problem, but rather to conduct comprehensive defensive research on biological agents and toxins under conditions of extreme care. The need is to be able to assess the likely threat, to develop detection measures and defenses, and to create sufficient uncertainty in the minds of Soviet leaders as well as those of other governments that they would hesitate to trust in such a method of warfare.

At this time, the Department of Defense does not have an adequate grasp of the biological-warfare threat and has not been giving it sufficient attention. Both intelligence and research in this area, though improved after a virtual halt during the 1970's, are strikingly deficient. The Department should be devoting much more resources and talent to addressing the chemical and biological threats of the future as well as those of the present. A moderate but intensive course of research, which does not include actual development of biological weapons, appears the only prudent one to follow.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

With respect to the four points it was directed to address, the Commission has concluded:

I. The Effect of Production on Achieving a Chemical Weapons Ban

1. There is no reason to believe that replacing existing U.S. chemical weapons with safer ones of binary design would make it more difficult to achieve a multilateral, verifiable ban on chemical weapons.

II. Adequacy of the Existing Stockpile To Deter

2. Modernization of the U.S. chemical weapons capability is needed.

3. The existing U.S. store of chemical weapons dates from the 1940's through 1960's and is in deteriorating condition. The bulk of it is of little military value, and much of it is militarily useless.

4. A small fraction of the stockpile has deterrent value. All of it, because the munitions as stored contain lethal chemical agent, is hazardous to handle.

5. Soviet chemical warfare capability is sizable, many times greater than that of the United States.

6. In order to prevent either quick defeat or early escalation to a nuclear exchange in time of war, a more complete U.S. chemical retaliatory capability is needed, particularly in order to be able to retaliate with persistent chemical agent against rear-area targets.

7. Failure to maintain an effective chemical retaliatory ca-

pability would leave the United States with nuclear retaliation as the principal threat to deter chemical attack.

8. The current stockpile should be replaced and destroyed at an accelerated rate.

III. The Binary Chemical Program

9. The proposed binary chemical program is a necessary step toward achieving an adequate U.S. chemical capability, but is not sufficient over the long run.

10. The great advantages of the proposed binary munitions are safety, and ease of transport, storage, handling, and ultimate destruction.

11. New delivery systems for rear-area targets are necessary and development of them should be accelerated.

12. The projected binary munitions program will not produce a more lethal generation of weapons. It provides, rather, a separate packaging of safe chemicals that react to form lethal agents only if they are launched. The agents they form after launching are identical to the lethal agents already produced and stored in the U.S. stockpile.

13. Substitution of these safer binary weapons to replace the existing U.S. munitions that are filled with lethal nerve agent will provide much greater safety for U.S. personnel, simplify transport and handling, and eliminate environmental hazards associated with the current U.S. chemical munitions.

14. Research and development on other chemical weapons, particularly for intermediate-range and long-range targets, should receive greater attention and support.

IV. Defensive Measures

15. Defensive measures, although essential to preserve lives and military capability, are not dependable and may be overcome by new Soviet chemical warfare techniques.

16. The expectation that protective measures alone can offset the advantages to the Soviets from a chemical attack is not realistic.

17. Even if defensive equipment succeeds in preserving life, it severely handicaps personnel who must wear it. Without a retaliatory capability, this leads to an overwhelming

military advantage for the attacker armed with chemical weapons.

V. Additional Recommendations

1. *Deployment.* Because of the safety and speed with which binary munitions can be transported, the Commission does not consider their peacetime deployment on foreign territory to be essential, provided adequate planning for rapid deployment is developed.

2. *Research and Development.* The Commission recommends that research and development efforts on both protective and detection equipment, as well as on retaliatory chemical agents and munitions, be accelerated, both in order to deter the Soviet Union from using its own new agents and in order to develop countermeasures.

3. *Intelligence.* The Commission recommends that U.S. intelligence gathering and analysis regarding chemical warfare activities of the Soviet Union and other countries be greatly improved.

4. *Soviet biological warfare program.* The Commission recommends that every effort be made to monitor and seek defenses against apparent Soviet efforts to develop biological weapons, including Soviet weapons that may use new genetic engineering techniques.

5. *Response to use of chemical weapons.* The Commission recommends that the United States devise and apply strict sanctions and penalties against countries that are using chemical weapons, and their suppliers.

6. *Exports.* The Commission recommends that the United States along with other countries implement an effective ban on exports of materials and equipment likely to be used to manufacture chemical weapons.

APPENDICES

APPENDIX A

DEPARTMENT OF DEFENSE AUTHORIZATION ACT, 1985
Public Law No. 98-525 (1984)

* * * *

CHEMICAL WARFARE REVIEW COMMISSION

Sec. 1511. (a) The President shall establish a bipartisan commission to be known as the "Chemical Warfare Review Commission". The Commission shall review the overall adequacy of the chemical warfare posture of the United States with particular emphasis on the question of whether the United States should produce binary chemical munitions, and shall report its findings and recommendations to the President not later than April 1, 1985. In developing its recommendations, the Commission shall consider —

(1) the relationship of chemical stockpile modernization by the United States with the ultimate goal of the United States of achieving a multilateral, comprehensive, and verifiable ban on chemical weapons;

(2) the adequacy of the existing United States stockpile of unitary chemical weapons in providing a credible deterrent to use by the Soviet Union of chemical weapons against United States and allied forces;

(3) whether the binary chemical modernization program proposed by the Department of Defense is adequate to support United States national security policy by posing a credible deterrent to chemical warfare; and

(4) the ability of defensive measures alone to meet the Soviet chemical warfare threat and the adequacy of funding for current and projected defensive measure programs.

(b) The President shall submit to Congress the report of the Commission, together with the President's comments on the report, not later than April 1, 1985.

* * * *

APPENDIX B

Executive Order No. 12502

Chemical Warfare Review Commission

By the authority vested in me as President by the Constitution and the laws of the United States of America, and in order to establish, in accordance with the provisions of Section 1511 of the Department of Defense Authorization Act, 1985 (Public Law 98-525), and of the Federal Advisory Committee Act, as amended (5 U.S.C. App. 1), a Chemical Warfare Review Commission, it is hereby ordered as follows:

Section 1. *Establishment.* (a) There is established the Chemical Warfare Review Commission. The Commission shall be composed of no more than nine members appointed or designated by the President. The membership shall be bipartisan.

(b) The President shall designate a Chairman from among the members of the Commission.

Sec. 2. *Functions.* (a) The Commission shall review the overall adequacy of the chemical warfare posture of the United States with particular emphasis on the question of whether the United States should produce binary chemical munitions. In conducting its review, the Commission shall take account of the considerations specified in Section 1511 of Public Law 98-525.

(b) The Commission shall make sequential reports to the President on its findings and recommendations, by February 15, 1985, as to the need to maintain a chemical retaliatory stockpile; by March 1, 1985, as to the adequacy of the current stockpile if one has been determined to be needed; and by March 15, 1985, as to whether the United States should produce binary chemical munitions or undertake other actions.

Sec. 3. *Administration.* (a) The heads of Executive agencies shall, to the extent permitted by law, provide the Commission such infor-

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mation as it may require for purposes of carrying out its functions.

(b) Members of the Commission shall serve without any additional compensation for their work on the Commission. However, members appointed from among private citizens may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by law for persons serving intermittently in the government service (5 U.S.C. 5701-5707), to the extent funds are available therefor.

(c) The Secretary of Defense shall provide the Commission with such administrative services, facilities, staff and other support services as may be necessary. Any expenses of the Commission shall be paid from such funds as may be available to the Secretary of Defense.

Sec. 4. *General.* (a) Notwithstanding any other Executive order, the functions of the President under the Federal Advisory Committee Act, as amended, except that of reporting to the Congress, which are applicable to the Commission, shall be performed by the Secretary of Defense, in accordance with guidelines and procedures established by the Administrator of General Services.

(b) The Commission shall terminate 30 days after submission of its report, or on September 30, 1985, whichever date is earlier.

RONALD REAGAN

THE WHITE HOUSE
January 28, 1985

APPENDIX C

Protocol Prohibiting the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, Geneva, June 17, 1925

The undersigned plenipotentiaries, in the name of their respective Governments:

Whereas the use in war of asphyxiating, poisonous or other gases, and of all analogous liquids, materials or devices, has been justly condemned by the general opinion of the civilised world; and

Whereas the prohibition of such use has been declared in Treaties to which the majority of Powers of the World are Parties; and

To the end that this prohibition shall be universally accepted as a part of International Law, binding alike the conscience and the practice of nations;

Declare:

That the High Contracting Parties, so far as they are not already Parties to Treaties prohibiting such use, accept this prohibition, agree to extend this prohibition to the use of bacteriological methods of warfare and agree to be bound as between themselves according to the terms of this declaration.

The High Contracting Parties will exert every effort to induce other States to accede to the present Protocol. Such accession will be notified to the Government of the French Republic, and by the latter to all signatory and acceding Powers, and will take effect on the date of the notification by the Government of the French Republic.

The present Protocol, of which the French and English texts are both authentic, shall be ratified as soon as possible. It shall bear today's date.

The ratifications of the present Protocol shall be addressed to the Government of the French Republic, which will at once notify the deposit of such ratification to each of the signatory and acceding Powers.

The instruments of ratification of and accession to the present

Protocol will remain deposited in the archives of the Government of the French Republic.

The present Protocol will come into force for each signatory Power as from the date of deposit of its ratification, and, from that moment, each Power will be bound as regards other Powers which have already deposited their ratifications.

In witness whereof the Plenipotentiaries have signed the present Protocol.

Done at Geneva in a single copy, this seventeenth day of June, One Thousand Nine Hundred and Twenty-Five.

APPENDIX D

Public Law No. 91-121, November 19, 1969, as Amended (50 U.S.C. §§1511-1520)

§ 1511. Reports to Congress

The Secretary of Defense shall submit an annual report to Congress on or before January 31 setting forth the amounts spent during the preceding year for research, development, test, and evaluation of all lethal and nonlethal chemical and biological agents. The Secretary shall include in each report a full explanation of each expenditure, including the purpose and the necessity therefor. The report shall include a full accounting of all experiments and studies conducted by the Department of Defense in the preceding year, whether directly or under contract, which involve the use of human subjects for the testing of chemical or biological agents.

§ 1512. Transportation, open air testing, and disposal; Presidential determination; report to Congress; notice to Congress and State Governors

None of the funds authorized to be appropriated by this Act or any other Act may be used for the transportation of any lethal chemical or any biological warfare agent to or from any military installation in the United States, the open air testing of any such agent within the United States, or the disposal of any such agent within the United States, until the following procedures have been implemented:

(1) the Secretary of Defense (hereafter referred to in this chapter as the "Secretary") has determined that the transportation or testing proposed to be made is necessary in the interests of national security;

(2) the Secretary has brought the particulars of the proposed transportation or testing to the attention of the Secretary of Health and Human Services, who in turn may direct the Sur-

geon General of the Public Health Service and other qualified persons to review such particulars with respect to any hazards to public health and safety which such transportation, testing, or disposal, may pose and to recommend what precautionary measures are necessary to protect the public health and safety;

(3) the Secretary has implemented any precautionary measures recommended in accordance with paragraph (2) above (including, where practicable, the detoxification of any such agent, if such agent is to be transported to or from a military installation for disposal): *Provided, however,* That in the event the Secretary finds the recommendation submitted by the Surgeon General would have the effect of preventing the proposed transportation, testing, or disposal, the President may determine that overriding considerations of national security require such transportation, testing, or disposal be conducted. Any transportation, testing, or disposal conducted pursuant to such a Presidential determination shall be carried out in the safest practicable manner, and the President shall report his determination and an explanation thereof to the President of the Senate and the Speaker of the House of Representatives as far in advance as practicable; and

(4) the Secretary has provided notification that the transportation, testing, or disposal will take place, except where a Presidential determination has been made: (A) to the President of the Senate and the Speaker of the House of Representatives at least 10 days before any such transportation will be commenced and at least 30 days before any such testing or disposal will be commenced; (B) to the Governor of any State through which such agents will be transported, such notification to be provided appropriately in advance of any such transportation.

§ 1513. Deployment, storage, and disposal; notification to host country and Congress; international law violations; reports to Congress and international organizations

(1) None of the funds authorized to be appropriated by this Act or any other Act may be used for the future deployment, storage, or disposal, at any place outside the United States, of

(A) any lethal chemical or any biological warfare agent, or

(B) any delivery system specifically designed to disseminate any such agent, unless prior notice of such deployment, storage, or disposal has been given to the country exercising jurisdiction over such place. In the case of any place outside the United States which

is under the jurisdiction or control of the United States Government, no such action may be taken unless the Secretary gives prior notice of such action to the President of the Senate and the Speaker of the House of Representatives. As used in this paragraph, the term "United States" means the several States and the District of Columbia.

(2) None of the funds authorized by this Act or any other Act shall be used for the future testing, development, transportation, storage, or disposal of any lethal chemical or any biological warfare agent outside the United States, or for the disposal of any munitions in international waters, if the Secretary of State, after appropriate notice by the Secretary whenever any such action is contemplated, determines that such testing, development, transportation, storage, or disposal will violate international law. The Secretary of State shall report all determinations made by him under this paragraph to the President of the Senate and the Speaker of the House of Representatives, and to all appropriate international organizations, or organs thereof, in the event such report is required by treaty or other international agreement.

§ 1514. "United States" defined

Unless otherwise indicated, as used in this chapter the term "United States" means the several States, the District of Columbia, and the territories and possessions of the United States.

§ 1515. Suspension; Presidential authorization

After November 19, 1969, the operation of this section, or any portion thereof, may be suspended by the President during the period of any war declared by Congress and during the period of any national emergency declared by Congress or by the President.

§ 1516. Delivery systems

None of the funds authorized to be appropriated by this Act shall be used for the procurement of delivery systems specifically designed to disseminate lethal chemical or any biological warfare agents, or for the procurement of delivery system parts or components specifically designed for such purpose, unless the President shall certify to the Congress that such procurement is essential to the safety and security of the United States.

§ 1517. Immediate disposal when health or safety are endangered

Nothing contained in this chapter shall be deemed to restrict the transportation or disposal of research quantities of any lethal chemical or any biological warfare agent, or to delay or prevent, in emergency situations either within or outside the United States, the immediate disposal together with any necessary associated transportation, of any lethal chemical or any biological warfare agent when compliance with the procedures and requirements of this chapter would clearly endanger the health or safety of any person.

§ 1518. Disposal; detoxification; report to Congress; emergencies

On and after October 7, 1970, no chemical or biological warfare agent shall be disposed of within or outside the United States unless such agent has been detoxified or made harmless to man and his environment unless immediate disposal is clearly necessary, in an emergency, to safeguard human life. An immediate report should be made to Congress in the event of such disposal.

§ 1519. Lethal binary chemical munitions

(a) Notwithstanding any other provision of law, none of the funds authorized to be appropriated by this or any other Act shall be used for the purpose of production of lethal binary chemical munitions unless the President certifies to Congress that the production of such munitions is essential to the national interest and submits a full report thereon to the President of the Senate and the Speaker of the House of Representatives as far in advance of the production of such munitions as is practicable.

(b) For purposes of this section the term "lethal binary chemical munitions" means (1) any toxic chemical (solid, liquid, or gas) which, through its chemical properties, is intended to be used to produce injury or death to human beings, and (2) any unique device, instrument, apparatus, or contrivance, including any components or accessories thereof, intended to be used to disperse or otherwise disseminate any such toxic chemical.

§ 1519a. Binary chemical weapons

(a) Limitation on procurement

Notwithstanding any other provision of law, no funds may be

obligated or expended after September 24, 1983, for the production of binary chemical weapons unless the President certifies to the Congress that for each 155-millimeter binary artillery shell or aircraft-delivered binary aerial bomb produced a serviceable unitary artillery shell from the existing arsenal shall be rendered permanently useless for military purposes.

(b) Use of funds for production base and procurement of components but not for production before October 1, 1985

(1) Funds appropriated pursuant to the authorization of appropriations for the Army in section 101 of this Act may be used for the establishment of a production base for binary chemical munitions and for the procurement of components for 155-millimeter binary chemical artillery projectiles, but such funds may not be used for the actual production of binary chemical munitions before October 1, 1985.

(2) Notwithstanding the provisions of paragraph (1), before the production of binary chemical munitions may begin after September 30, 1985, the President must certify to Congress in writing that, in light of circumstances prevailing at the time the certification is made, the production of such munitions is essential to the national interest.

(3) For purposes of this subsection, "production of binary chemical munitions" means the final assembly of weapon components and the filling or loading of components with binary chemicals.

§ 1520. Use of human subjects for testing of chemical or biological agents by Department of Defense; accounting to congressional committees with respect to experiments and studies; notification of local civilian officials

(a) Not later than thirty days after final approval within the Department of Defense of plans for any experiment or study to be conducted by the Department of Defense, whether directly or under contract, involving the use of human subjects for the testing of chemical or biological agents, the Secretary of Defense shall supply the Committees on Armed Services of the Senate and House of Representatives with a full accounting of such plans for such experiment or study, and such experiment or study may then be conducted only after the expiration of the thirty-day period beginning on the date such accounting is received by such committees.

(b)(1) The Secretary of Defense may not conduct any test or experiment involving the use of any chemical or biological agent on civilian populations unless local civilian officials in the area in which

the test or experiment is to be conducted are notified in advance of such test or experiment, and such test or experiment may then be conducted only after the expiration of the thirty-day period beginning on the date of such notification.

(2) Paragraph (1) shall apply to tests and experiments conducted by Department of Defense personnel and tests and experiments conducted on behalf of the Department of Defense by contractors.

APPENDIX E

Statement by President Nixon on Chemical and Biological Weapons, November 25, 1969

Soon after taking office I directed a comprehensive study of our chemical and biological defense policies and programs. There had been no such review in over 15 years. As a result, objectives and policies in this field were unclear and programs lacked definition and direction.

Under the auspices of the National Security Council, the Departments of State and Defense, the Arms Control and Disarmament Agency, the Office of Science and Technology, the intelligence community, and other agencies worked closely together on this study for over 6 months. These Government efforts were aided by contributions from the scientific community through the President's Science Advisory Committee.

This study has now been completed and its findings carefully considered by the National Security Council. I am now reporting the decisions taken on the basis of this review.

Chemical Warfare Program

As to our chemical warfare programs, the United States:

—Reaffirms its oft-repeated renunciation of the first use of lethal chemical weapons.

—Extends this renunciation to the first use of incapacitating chemicals.

Consonant with these decisions, the administration will submit to the Senate, for its advice and consent to ratification, the Geneva Protocol of 1925 which prohibits the first use of "Asphyxiating, Poisonous or other Gases and of Bacteriological Methods of Warfare." The United States has long supported the principles and objectives of this Protocol. We take this step toward formal ratification to reinforce our continuing advocacy of international constraints on the use of these weapons.

Biological Research Program

Biological weapons have massive, unpredictable and potentially uncontrollable consequences. They may produce global epidemics and impair the health of future generations. I have therefore decided that:

—The United States shall renounce the use of lethal biological agents and weapons, and all other methods of biological warfare.

—The United States will confine its biological research to defensive measures such as immunization and safety measures.

—The Department of Defense has been asked to make recommendations as to the disposal of existing stocks of bacteriological weapons.

In the spirit of these decisions, the United States associates itself with the principles and objectives of the United Kingdom Draft Convention which would ban the use of biological methods of warfare. We will seek, however, to clarify specific provisions of the draft to assure that necessary safeguards are included.

Neither our association with the Convention nor the limiting of our program to research will leave us vulnerable to surprise by an enemy who does not observe these rational restraints. Our intelligence community will continue to watch carefully the nature and extent of the biological programs of others.

These important decisions, which have been announced today, have been taken as an initiative toward peace. Mankind already carries in its own hands too many of the seeds of its own destruction. By the examples we set today, we hope to contribute to an atmosphere of peace and understanding between nations and among men.

RICHARD NIXON

APPENDIX F

Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, April 10, 1972

The States Parties to this Convention,

Determined to act with a view to achieving effective progress towards general and complete disarmament, including the prohibition and elimination of all types of weapons of mass destruction, and convinced that the prohibition of the development, production and stockpiling of chemical and bacteriological (biological) weapons and their elimination, through effective measures, will facilitate the achievement of general and complete disarmament under strict and effective international control,

Recognizing the important significance of the Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare , signed at Geneva on June 17, 1925, and conscious also of the contribution which the said Protocol has already made, and continues to make, to mitigating the horrors of war,

Reaffirming their adherence to the principles and objectives of that Protocol and calling upon all States to comply strictly with them,

Recalling that the General Assembly of the United Nations has repeatedly condemned all actions contrary to the principles and objectives of the Geneva Protocol of June 17, 1925.

Desiring to contribute to the strengthening of confidence between peoples and the general improvement of the international atmosphere,

Desiring also to contribute to the realization of the purposes and principles of the Charter of the United Nations,

Convinced of the importance and urgency of eliminating from the arsenals of States, through effective measures, such dangerous weapons of mass destruction as those using chemical or bacteriological (biological) agents,

Recognizing that an agreement on the prohibition of bacteriological (biological) and toxin weapons represents a first possible step towards the achievement of agreement on effective measures for the prohibition of the development, production and stockpiling of chemical weapons, and determined to continue negotiations to that end,

Determined, for the sake of all mankind, to exclude completely the possibility of bacteriological (biological) agents and toxins being used as weapons.

Convinced that such use would be repugnant to the conscience of mankind and that no effort should be spared to minimize this risk,

Have agreed as follows:

Article I

Each State Party to this Convention undertakes never in any circumstances to develop, produce, stockpile or otherwise acquire or retain:

(1) Microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for phophylactic, protective or other peaceful purposes;

(2) Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.

Article II

Each State Party to this Convention undertakes to destroy, or to divert to peaceful purposes, as soon as possible but not later than nine months after the entry into force of the Convention, all agents, toxins, weapons, equipment and means of delivery specified in article I of the Convention, which are in its possession or under its jurisdiction or control. In implementing the provisions of this article all necessary safety precautions shall be observed to protect populations and the environment.

Article III

Each State Party to this Convention undertakes not to transfer to any recipient whatsoever, directly or indirectly, and not in any way to assist, encourage, or induce any State, group of States or international organizations to manufacture or otherwise acquire any of the agents, toxins, weapons, equipment or means of delivery specified in article I of the Convention.

Article IV

Each State Party to this Convention shall, in accordance with its

constitutional processes, take any necessary measures to prohibit and prevent the development, production, stockpiling, acquisition or retention of the agents, toxins, weapons, equipment and means of delivery specified in article I of the Convention, within the territory of such State, under its jurisdiction or under its control anywhere.

Article V

The States Parties to this Convention undertake to consult one another and to cooperate in solving any problems which may arise in relation to the objective of, or in the application of the provisions of, the Convention. Consultation and cooperation pursuant to this article may also be undertaken through appropriate international procedures within the framework of the United Nations and in accordance with its Charter.

Article VI

(1) Any State Party to this Convention which finds that any other State Party is acting in breach of obligations deriving from the provisions of the Convention may lodge a complaint with the Security Council of the United Nations. Such a complaint should include all possible evidence confirming its validity, as well as a request for its consideration by the Security Council.

(2) Each State Party to this Convention undertakes to cooperate in carrying out any investigation which the Security Council may initiate, in accordance with the provisions of the Charter of the United Nations, on the basis of the complaint received by the Council. The Security Council shall inform the States Parties to the Convention of the results of the investigation.

Article VII

Each State Party to this Convention undertakes to provide or support assistance, in accordance with the United Nations Charter, to any Party to the Convention which so requests, if the Security Council decides that such Party has been exposed to danger as a result of violation of the Convention.

Article VIII

Nothing in this Convention shall be interpreted as in any way limiting or detracting from the obligations assumed by any State under the Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, signed at Geneva on June 17, 1925.

Article IX

Each State Party to this Convention affirms the recognized objective of effective prohibition of chemical weapons and, to this end, undertakes to continue negotiations in good faith with a view to reaching early agreement on effective measures for the prohibition of their development, production and stockpiling and for their destruction, and on appropriate measures concerning equipment and means of delivery specifically designed for the production or use of chemical agents for weapons purposes.

Article X

(1) The States Parties to this Convention undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes. Parties to the Convention in a position to do so shall also cooperate in contributing individually or together with other States or international organizations to the further development and application of scientific discoveries in the field of bacteriology (biology) for prevention of disease, or for other peaceful purposes.

(2) This Convention shall be implemented in a manner designed to avoid hampering the economic or technological development of States Parties to the Convention or international cooperation in the field of peaceful bacteriological (biological) activities, including the international exchange of bacteriological (biological) agents and toxins and equipment for the processing, use or production of bacteriological (biological) agents and toxins for peaceful purposes in accordance with the provisions of the Convention.

Article XI

Any State Party may propose amendments to this Convention. Amendments shall enter into force for each State Party accepting the amendments upon their acceptance by a majority of the States Parties to the Convention and thereafter for each remaining State Party on the date of acceptance by it.

Article XII

Five years after the entry into force of this Convention, or earlier if it is requested by a majority of Parties to the Convention by submitting a proposal to this effect to the Depositary Governments, a conference of States Parties to the Convention shall be held at Geneva, Switzerland, to review the operation of the Convention, with a view to assuring that the purposes of the preamble and the

provisions of the Convention, including the provisions concerning negotiations on chemical weapons, are being realized. Such review shall take into account any new scientific and technological developments relevant to the Convention.

Article XIII.

(1) This Convention shall be of unlimited duration.

(2) Each State Party to this Convention shall in exercising its national sovereignty have the right to withdraw from the Convention if it decides that extraordinary events, related to the subject matter of the Convention, have jeopardized the supreme interests of its country. It shall give notice of such withdrawal to all other States Parties to the Convention and to the United Nations Security Council three months in advance. Such notice shall include a statement of the extraordinary events it regards as having jeopardized its supreme interests.

Article XIV

(1) This Convention shall be open to all States for signature. Any State which does not sign the Convention before its entry into force in accordance with paragraph (3) of this Article may accede to it at any time.

(2) This Convention shall be subject to ratification by signatory States. Instruments of ratification and instruments of accession shall be deposited with the Governments of the United States of America, the United Kingdom of Great Britain and Northern Ireland and the Union of Soviet Socialist Republics, which are hereby designated the Depositary Governments.

(3) This Convention shall enter into force after the deposit of instruments of ratification by twenty-two Governments, including the Governments designated as Depositaries of the Convention.

(4) For States whose instruments of ratification or accession are deposited subsequent to the entry into force of this Convention, it shall enter into force on the date of the deposit of their instruments of ratification or accession.

(5) The Depositary Governments shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification or of accession and the date of the entry into force of this Convention, and of the receipt of other notices.

(6) This Convention shall be registered by the Depositary Governments pursuant to Article 102 of the Charter of the United Nations.

Article XV

This Convention, the English, Russian, French, Spanish and Chinese texts of which are equally authentic, shall be deposited in the archives of the Depositary Governments. Duly certified copies of the Convention shall be transmitted by the Depositary Governments to the Governments of the signatory and acceding states.

IN WITNESS WHEREOF the undersigned, duly authorized, have signed this Convention.

DONE in triplicate, at the cities of Washington, London and Moscow, this tenth day of April, one thousand nine hundred and seventy-two.

APPENDIX G

Executive Order No. 11850

Renunciation of Certain Uses in War of Chemical Herbicides and Riot Control Agents

The United States renounces, as a matter of national policy, first use of herbicides in war except use under regulations applicable to their domestic use for control of vegetation within U.S. bases and installations or around their immediate defensive perimeters and first use of riot control agents in war except in defensive military modes to save lives such as:

(a) Use of riot control agents in riot control situations in areas under direct and distinct U.S. military control, to include controlling rioting prisoners of war.

(b) Use of riot control agents in situations in which civilians are used to mark or screen attacks and civilian casualties can be reduced or avoided.

(c) Use of riot control agents in rescue missions in remotely isolated areas, of downed aircrews and passengers, and escaping prisoners.

(d) Use of riot control agents in rear echelon areas outside the zone of immediate combat to protect convoys from civil disturbances, terrorists and paramilitary organizations.

I have determined that the provisions and procedures prescribed by this Order are necessary to ensure proper implementation and observance of such national policy.

NOW, THEREFORE, by virtue of the authority vested in me as President of the United States of America by the Constitution and laws of the United States and as Commander-in-Chief of the Armed Forces of the United States, it is hereby ordered as follows:

Section 1. The Secretary of Defense shall take all necessary measures to ensure that the use by the Armed Forces of the United States of any riot control agents and chemical herbicides in war is

prohibited unless such use has Presidential approval in advance.

Section 2. The Secretary of Defense shall prescribe the rules and regulations he deems necessary to ensure that the national policy herein announced shall be observed by the Armed Forces of the United States.

GERALD R. FORD

THE WHITE HOUSE
April 8, 1975

APPENDIX H

Ministry of Defense, Federal Republic of Germany
White Paper 1983: The Security of the Federal Republic of Germany
(Excerpt)

* * * *

Chemical Weapons

285. Soviet military doctrine still considers the use of chemical agents a means of warfare. Its command principles envisage the offensive use of C agents in the conduct of operations.

The Warsaw Pact has indeed both the material and the manpower for the conduct of chemical warfare. Its potential consists of a number of lethal or paralytic chemical agents which can be delivered by missiles, guns, or aircraft. Its forces are well prepared, in respect of both equipment and training, to operate under conditions of chemical contamination.

During the past ten years, the Soviet Union has consistently been improving both the chemical defense capability and offensive capability of her forces.

286. The United States, by contrast with the Soviet Union, ceased to produce chemical warfare agents about 14 years ago. The hope that by so doing the Soviet Union might be moved to follow suit and that the conclusion of a comprehensive convention banning C weapons might be promoted has, however, failed to materialize despite years of negotiation.

287. Whether, in the eventuality of a conflict, the Warsaw Pact is willing to wage chemical war will depend upon whether it respects the rules of the International Law of War and upon its estimate of the ability and preparedness of NATO to resort to a chemical coun-

terdeterrent or to escalate with nuclear weapons. In this context, the Warsaw Pact must proceed from the assumption that the use of chemical agents would not be regarded by NATO as conventional warfare and that consequently the conflict would assume a new quality.

288. To deter the Warsaw Pact from using chemical weapons, NATO relies mainly upon its conventional and nuclear forces. Nonetheless, the NATO forces must be capable of using chemical agents in retaliation within limits. In the Alliance, possession of a chemical deterrent potential is confined to the United States, and is limited. In accordance with the NATO Status of Forces Agreement, some C agents are stored in the Federal Republic of Germany. Details of type, scope, and deployment, are known to the Federal Government. Their storage meets the strictest safety requirements, so that any danger to the population is precluded by every standard of human judgement. Information on their storage is subject, both in NATO and in the Warsaw Pact, to stringent security regulations. It has therefore been the practice of every federal government fundamentally to refuse to divulge such information and neither to confirm nor to deny any assertions concerning the storage of chemical agents.

The legal view held by the Federal Government on the use of chemical weapons is unequivocal: the 1925 Geneva Protocol prohibits the use of chemical weapons in war. Today, the community of nations regards this prohibition as a customary rule of international law, although quite a number of nations, when acceding to the Geneva Protocol, have made reservations to the effect that their obligation to comply with it end in respect of any enemy whose forces disregard the prohibition. That fact limits the scope of the ban. The German Reich, upon ratifying the Geneva Protocol in 1929, made no such reservation.

However, as long as the threat posed by chemical weapons continues, the Federal Government, like those of our allies, considers it indispensable for NATO not only to improve its defence capabilities against such weapons, but also to maintain a capacity for reprisals, albeit limited in size, in order to deter any aggressor from using chemical weapons in violation of international law.

* * * *

APPENDIX I

GLOSSARY

Acetylcholinesterase—An enzyme of the human body necessary for the functioning of the nervous system.

Atropine—A chemical substance that inhibits the physiological effects of nerve agents on the human body.

Bacteriological (Biological) and Toxin Weapons Convention—(See Appendix F for text.)

Bigeye bomb—A binary air-delivered munition (BLU-80/B) that produces VX nerve agent through chemical reaction of sulfur with QL.

Biological agents—Living microscopic organisms that can be used in weapons to cause death or incapacitation.

Blister agents—Chemical agents that injure by blistering (burning) the skin and mucous membranes.

Blood agents—Chemical agents that enter the body by the respiratory system and attack the blood cells, interfering with their ability to carry oxygen.

BZ—An incapacitating psychochemical agent that causes disorientation and temporarily degrades mental activities.

CS—The standard U.S. military riot-control agent, a non-lethal agent that causes temporary skin and eye irritation.

Cyanogen chloride (CK)—A nonpersistent blood agent.

Defensive measures—Measures intended to enable troops to survive and operate in a chemical environment. They include detection, protection, and decontamination, plus medical prophylaxis and antidotes.

DF (methylphosphonic difluoride)—One of the components of the binary 155 mm artillery shell and the binary MLRS rocket.

"Flash"—A chemical agent is said to flash when it burns rapidly instead of dispersing.

"G" agents—The nerve agents Tabun (GA), Sarin (GB), and Soman (GD), that attack primarily through the respiratory system.

Geneva Protocol of 1925—(See Appdendix C for text.)

Hague Declaration of 1899—A pledge by most world powers not to use "projectiles the sole object of which is the diffusion of asphyxiating or deleterious gases."

Hydrogen cyanide (AC)—A nonpersistent blood agent.

Incapacitating agent—An agent designed to destroy the combat effectiveness of enemy troops without inflicting permanent injury or death.

Lewisite (L)—A blister agent.

Loft maneuver—A common delivery tactic for air-delivered free-fall weapons. The tactic requires the delivery aircraft, at a designated point from the target, to begin a quick climb before releasing its weapons. This climb imparts a vertical velocity to the weapon that allows it to continue upward after release, placing it in a trajectory toward the target. The tactic was developed to reduce aircraft exposure to radar and to antiaircraft fire.

MLRS—Multiple-launch rocket system. A surface-to-surface weapon for intermediate-range targets.

Mustard (H)—A persistent blister agent.

Nerve agents—Chemical warfare agents that bind to acetylcholinesterase, an enzyme of the human body essential to the functioning of the nervous system. These are highly toxic and usually kill very quickly.

Nonpersistent agent—An agent that retains its potency on the battlefield from a few minutes to about an hour.

OPA—A mixture of isopropylamine and isopropyl alcohol; one binary component of the M-687 artillery round.

Organophosphorus compounds—Organic chemical compounds that contain phosphorus. Nerve agents belong to this group, as do a number of modern insecticides.

Persistent agent—An agent that retains its potency on the battlefield for days up to weeks.

QL (ethyl-2-diisopropylaminethylmethyl)—One binary component of the Bigeye bomb.

Semipersistent agent—An agent whose potency is measured in days.

Toxins—Non-living chemical substances produced by living organisms. Toxins can now also be produced synthetically by genetic engineering.

Unitary chemical weapons—Weapons filled with actual chemical agent. All existing U.S. and Soviet chemical weapons are unitary.

"V" agents—Persistent nerve agents developed in the mid-1950's. Lethal V agents are absorbed through the skin.

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